The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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The Late Hon. Daniel J. Morrell.

In a few lines the Associated Press chronicled last week the decease of one who has for fully a generation ranked as one of the leading iron manufacturers in the country. Hon. Daniel J. Morrell died at his residence on the 20th, at Johnstown, the scene of the successful labors of a lifetime.

Mr. Morrell was born in Maine in 1821, and when 16 years old went to Philadelphia, where he associated himself with the wholesale dry-goods house of Trotter, Morrell & Co., at 32 North Fourth street. In 1842 he embarked in the same business with his brother David. Two years later he became associated with Oliver Martin, dealer in fancy dry goods, at No. 28 North Fourth street. In 1855 he assumed the management of the Cambria Iron Works and made his home at Johnstown. The Cambria Iron Company had failed, and their heaviest creditors were Philadelphia merchants who had sold them goods. These merchants, in the hope of securing themselves against heavy losses, obtained control of the works, and selected Mr. Morrell, who was one of their number, to manage the enterprise. So apt, shrewd and intelligent did the young dry-goods merchant prove to be in his novel position as a manufacturer of iron that he speedily mastered the difficulties which environed him, organized the various departments of the works into harmonious system, secured an enviable reputation for his manufactured products, and won a position in the very front rank of successful American manufacturers

Mr. Morrell as a manager was prompt to introduce improvements in his works. He interested himself very early in the pneumatic or Bessemer process, and his faith in its success was so great that he induced his associates to erect a plant at Johnstown, which was among the first successful Bessemer steel works in the country. These steel works were for years the most productive in the world. When Mr. Morrell took charge of the works of the Cambria Iron Company, almost 30 years ago, they comprised a few small charcoal furnaces, four small coke furnaces and an iron rail mill. The company also owned some coal and ore lands in the immediate vicinity. The possessions of this corporation are now enormous. They own a very great area of land in the vicinity of the works, in the adjoining Blair County, in the Connellsville coke region and in the Lake Superior iron ore region. They have 11 blast furnaces, Bessemer steel works, open-hearth steel works, rail mills, billet mills, rod mills, &c. Their Gautier Steel Department turns out wire and merchant steel, and employs as many hands in itself as the entire works did only a few years ago.

Mr. Morrell took an active part in all questions affecting the prosperity of his trade, being a leading spirit in the American Iron and Steel Association, of which he became president in 1879, holding that office until failing health compelled him to retire from it, and from all active business as well, in January last. On the establishment of the Republican party he became attached to that organization, and for many years was one of its leaders in Pennsylvania. In 1866 Mr. Morrell was elected to the National House of Representatives, being re-elected in 1868, but defeated by a small majority in 1870. In Congress he paid attention chiefly to all matters relating to industrial questions, and was made chairman of the Committee on Manufactures. The most important feature, however, of his Congressional career was his introduction on the 9th of March, 1870, of a bill to provide for the celebration in Philadelphia of the one hundredth anniversary of American independence. This bill became a law mainly through his persistent advocacy and through the happy effect produced upon Congress and the country by his admirably conceived speech of the 14th December, 1870, in favor of its passage. On the organization, in March, 1872, of the Centennial Commission provided for in this act, Mr. Morrell, who had been appointed by Governor Geary one of the commissioners for Pennsylvania, was offered the presidency of that body. This he declined, but he became chairman of the Executive Committee, a position of greater influence and more onerous duties, in which he contributed largely to the success of the Centennial Exposition. Mr. Morrell attended the Paris Exposition of 1878 as a commissioner from the United States, and presented to the Secretary of State, on his return home, an exhaustive and comprehensive report on the exhibits of iron and steel, and upon the condition of the iron and steel industry of the world up to that time.

Mr Morrell's connection with the iron and steel trades is so important a part of the industrial history of the country that we are moved to give the following extract from the speech of the late Samuel J. Reeves at the banquet in honor of Mr. Morrell in May, 1878, tendered him by the citizens of Philadelphia on the eve of his departure for France as U. S. Commissioner at the Paris Exposition:

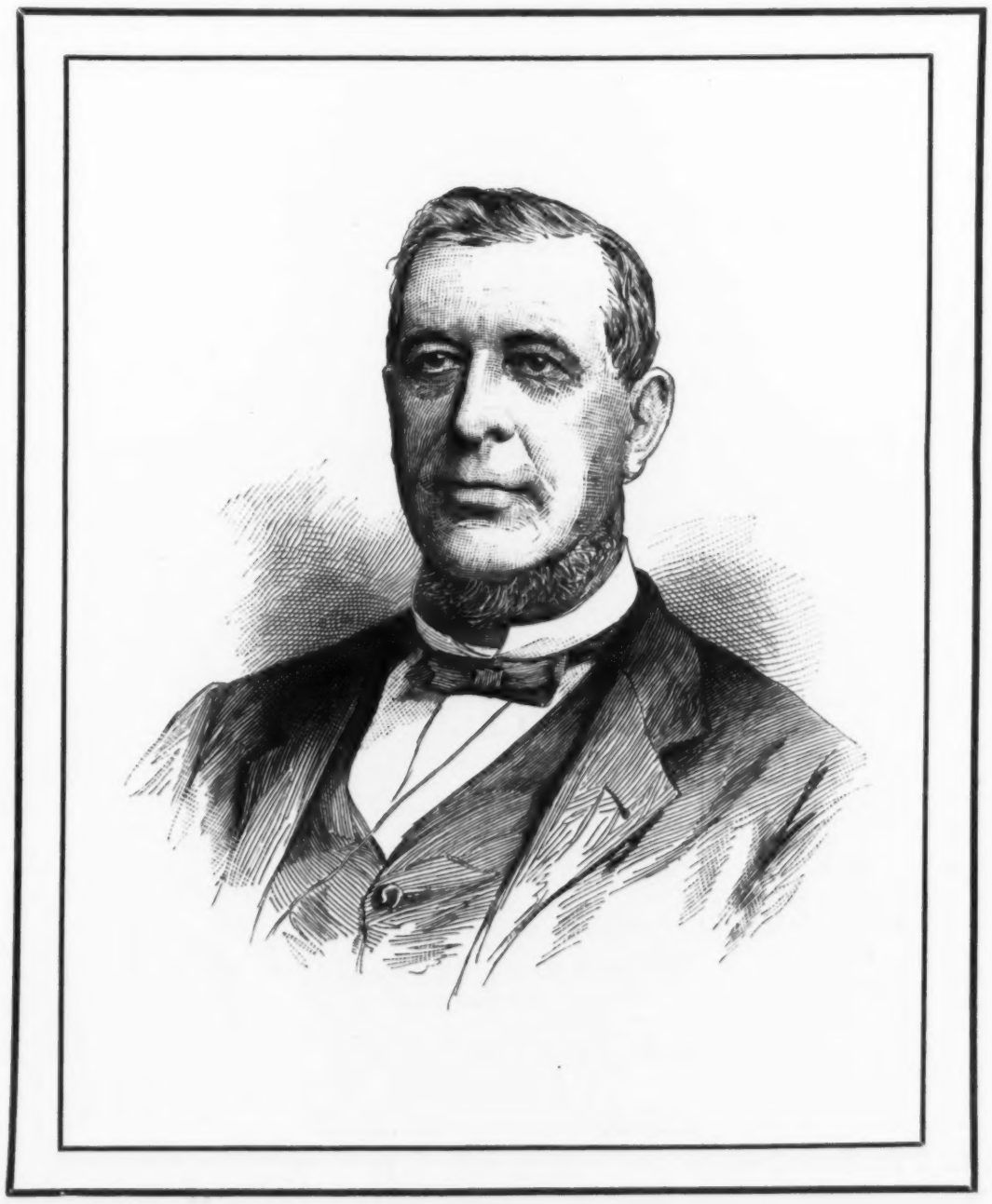
"When I look back to the time he first entered upon his duties as a manager, entirely ignorent as he was of the art of making iron, I cannot help admiring his courage and self-reliance in believing that he could successfully overcome the difficulties before him, and win, as he has done, the reputation that is justly awarded him as one of the most cultured and accomplished ironmasters in the country. The secret of such eminent success must be mainly attributed to his thorough business training as a merchant, to his remarkable faculty of organizing and directing labor and systematizing accounts, and, not least, to his well-balanced head and thorough integrity. Certainly in addition to these personal qualifications he enjoyed the good fortune to be associated with able coadjutors, men of broad views and wide experience, who ably supported him and gave him their confidence and inspired him with zeal and courage.

"After the expiration of the lease of the Cambria Iron Works to Wood, Morrell & Co., a period running through seven years, the property reverted to the control of the company, and Mr. Morrell was appointed general manager. The same success attended his management—the mills and furnaces constantly increasing in capacity and thoroughness. Old processes were abandoned for better devices, and antiquated machinery disappeared to be replaced by substantial improvements and more economical methods. At these works was first introduced the three-high mill, the invention of that eminent mechanical engineer, John Fritz, who was at the time in the service of the company. Mr. Morrell's power of estimating the character of men was so acute that he was always able to select assistants of the highest order, and to his judgment in this direction is largely due the excellent system and intelligence found in the minor departments of the great establishment under his charge.

"The sole business of the Cambria Iron Company up to the year 1871 was the production of iron rails, in the manufacture of which they had acquired an excellent reputation; but long prior to this year the time had arrived when it became apparent that rails made of steel by the pneumatic process, invented by Henry Bessemer, must ultimately displace those made of iron, on account of their greater durability. Here was a question to be decided by the owners of iron-rail mills, involving the value of property to an enormous amount, and rendering the costly establishments then in existence comparatively worthless. No one perceived the coming revolution sooner than Mr. Morrell, and it was through his efforts and persistence that the directors of this company were induced to be among the first to enter upon the new and untried enterprise of manufacturing Bessemer rails. It required a thorough mastery of the new process, great ingenuity and large capital to undertake such an enterprise, but all these the Cambria Iron Company found themselves possessed of. Mr. Morrell and the Fritz Brothers, John and George, had already studied up the subject and invented and improved upon what they took in hand.

"The first experiments in this country in the manufacture of pneumatic steel were conducted at the Cambria Iron Company's Works by William Kelly in 1857–58–59, and the first pneumatic converter was constructed at Johnstown. In May, 1863, the Kelly Process Company were organized, of which Mr. Morrell was a member, and they were successful in making steel at Wyandotte, Mich. In 1864 the control of Mr. Bessemer's process and patents for the United States was obtained by Messrs. Winslow, Griswold and Holley, of Troy, N. Y. The conflict of the rival owners of the Kelly and Bessemer patents prevented the extension of the business. Counsel was employed, and the parties were about to enter upon a protracted litigation when Mr. Morrell, who had obtained full authority from the Kelly Process Company, early in 1866, effected a consolidation of all the interests and the immediate extension of the business. Through his advice, though much to the dissatisfaction of some of the parties in interest, the royalty for the use of the joint patents was reduced from the enormous figure at which it was held prior to the consolidation of the interests; but the result proved the wisdom of Mr. Morrell's suggestion, the owners of the patents and the users of the process being mutually benefited by the low rates. If it had not been for these efforts of Mr. Morrell several years of the steel industry now so well established would have been lost to the country."

In his personal character Mr. Morrell was an amiable and delightful man. At home in Johnstown, he was greatly respected and beloved, and he will be sincerely mourned by a large circle of friends, but by none more than by his neighbors and the great army of workmen employed by the company.



DANIEL J. MORRELL.

The Construction of Ordnance.—The Special Committee on the Construction of Ordnance recommend that, 1, all pieces forged in the tubular state should be annealed in that state before tempering; 2, all pieces forged in the solid state, with the object of being finally used in the tubular state, should be annealed in the tubular state prior to tempering; 3, the annealing to be effected by raising the temperature of the piece gradually, carefully and uniformly to the highest point that can be applied without injuring the steel, and by cooling in a gradual and uniform manner, and, 4, after tempering, the piece is to be raised to a heat approaching that at which it was tempered, and reannealed by being allowed to cool slowly. They also recommend that the "tests for steel" should remain unaltered, but think that a percussive test of tubes and breech pieces by water pressure should be devised; that the chases of breech-loader guns should be strengthened; that each individual tubular forging should be made as thin as possible, the requisite strength being obtained by a greater number of layers; that some sizes of guns should be looped to the muzzle, and others with a double tube or liners, and that the guns of the future should be generally made more suitable for increased charges of slower burning powder.

Raising a Masonry Arch.

Les Annales des Travaux Publics for July, 1885, describes the lifting to a more elevated position of a masonry arch having a span 32.8 feet and a rise of 4.26 feet. The arch was 15 feet wide, and at the key was 2.88 feet deep. A lining of plank was first put under the arch and then five centers made of wrought iron. Under each end of the arch were then placed two bents of timber 5.8 feet apart and well braced in both directions. Each of these bents rested on two longitudinal timbers, and between these sticks, midway between the centers, were located double wedges, and between each set of wedges and directly under the centers and their posts were lifting-screws. This arrangement having been carried out, the arch was cut at the springing lines with hammer and chisel, leaving, until all was ready, three points of support on each side. When the weight of the arch, 180 tons, was thrown entirely upon the centers, several cracks made their appearance, and the crown sank about 1½ inches. At the first turn of the screws, however, it was found that the cracks showed no signs of further increase, and the lifting was commenced with great uniformity. At each vertical inch of hoist the screws were stopped and the wedges tightly driven. The total distance raised was 1.4 feet, and this work was accomplished in 14 hours. During the lifting a further sinking of about ¾ inch took place, and the eight cracks extended from end to end of the arch. These cracks had a width of ⅜ inch, but they were lost in the interior of the masonry, without appearing on the extrados. These fissures were filled with a thin grout of one part Portland cement to one part of sand, and eight days were allowed for the setting of this cement before the centers were removed. When the arch rested on its new abutments a fresh hair crack appeared, but without doing any further damage.

Sales of Pig Iron in Cincinnati.

"Nothing," says Mr. Maxwell, in his Chamber of Commerce report, "exhibits the steady growth of the pig-iron business of Cincinnati so much as the figures touching sales in the past year. In the midst of shrinkage in prices, general doubt as to the business outcome of the year, and a tendency to diminished consumption in almost all the walks of production, the figures for the year present a gratifying result, in that they show that Cincinnati has sold more iron during the past year than ever before in its history, the sales of pig iron at this city for actual consumption, according to confidential returns furnished the superintendent of the Chamber of Commerce, having aggregated 427,934 net tons, in comparison with 417,635 in 1882–83, 386,510 tons in 1881–82, 334,702 in 1880–81, 248,519 in 1879–80, 212,281 in 1878–79, 125,912 in 1877–78, 129,194 in 1876–77 and 137,646 in 1875–76. These figures embrace, also, iron sold for direct shipment from the furnaces to the points of consumption, though the same may not have come to this city, the quantity so sold having, as in other late years, largely exceeded the actual receipts here, which in the past year aggregated 163,440 tons, in comparison with 141,587 in 1882–83, 156,340 in 1881–82 and 138,164 in 1880–81, the actual shipments having been 121,659 tons, compared with 106,819 in 1882–83, 100,983 in 1881–82, 97,655 in 1880–81 and 64,409 in 1879–80.

"The increase in sales, doubtless, is largely traceable to the firm hold which Cincinnati has taken of the irons of the South, which find here liberal distribution. It is an interesting fact that during the year Cincinnati has sold an amount of pig iron equal to 29 per cent. of the entire production of both the stonecoal and charcoal irons of Alabama, Georgia, Indiana, Kentucky, Michigan, Missouri, Ohio, Tennessee and West Virginia in the calendar year of 1883, though it was a most unfavorable period generally. The trade of Cincinnati, in this great department of business, with its unequaled assortment of irons and its conveniences for expeditious and economical distribution, never has occupied a position so strong as at the present time, nor given such large promise of future usefulness to this city, and it is a matter worthy of record that coupled with large enterprise and sagacity on the part of dealers and receivers here, which contributed liberally to this end, has been the active co-operation of the railroads concentrating in this city, which have appreciated both their own and the city's opportunities. The total approximate value of the sales of pig iron in this city in the past year was $9,307,564, compared with $10,060,827 in 1882–83. $10,698,596 in 1881–82, $9,006,830 in 1880–81, $8,708,105 in 1879–80, $3,385,326 10 years ago, and $1,767,000 in 1868–69."

A successful attempt was made last year in Leipsic to remove by chemical means the incrustation that coated the interior of the force main from the pumping station to the reservoir. The main is about 15½ inches wide and 4.55 km. long, and the incrustation was from 13 to 24 mm. thick, and in places thicker still. The operation lasted from the 7th of March to the 11th of May, and during that period at intervals the pipe was filled with dilute hydrochloric acid eight times, with soda solution three times, and with a solution of chloride of lime once, being washed out thoroughly with water between the successive applications. It was stated that the incrustation was entirely removed, and the practical effect of the cleaning was indicated by the pressure gauge, there being a decrease of from 1.8 to 2 atmospheres pressure at the pumps.

Mr. Robert F. Fairlie died on the 31st ult. in the 55th year of his age. His double-ended and double-bogie engines, known as "Fairlie" engines, have done good work, especially in Russia, Peru, Mexico, Canada and New Zealand, but his system was never carried out in its entirety. A few years ago Mr. Fairlie made a trip to Venzuela to report on the construction of a system of railways on his plan for that country, but unfortunately was attacked by sunstroke and jungle fever, and had a long illness from which he never really recovered.

An increased force of men will shortly be put on the Bristol Iron Mine, Ottawa. A branch of the Pontiac and Pacific Railway is to be built to the mine, to be completed by October 1.

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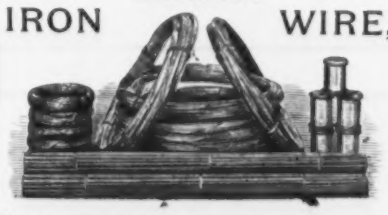

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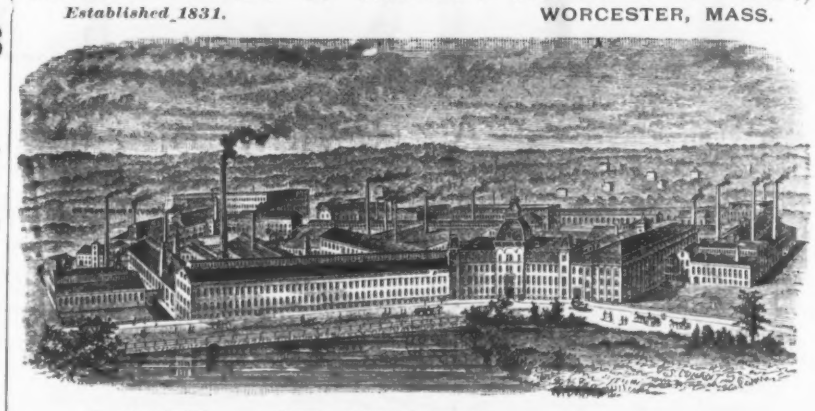

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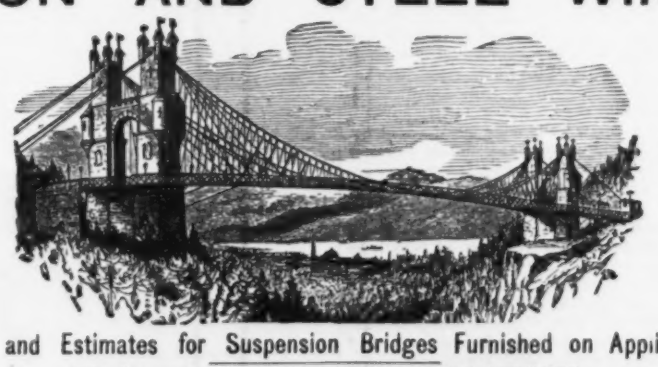

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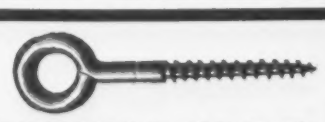

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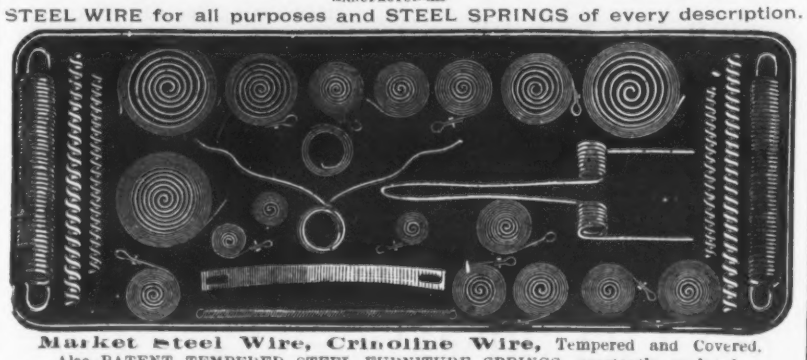

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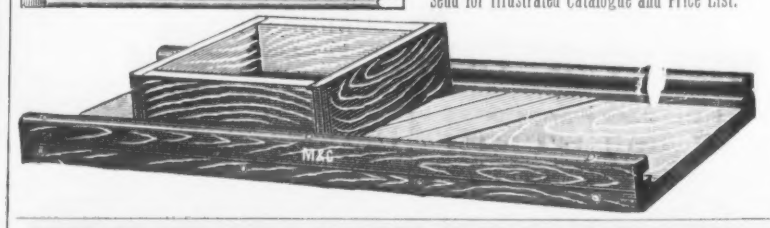

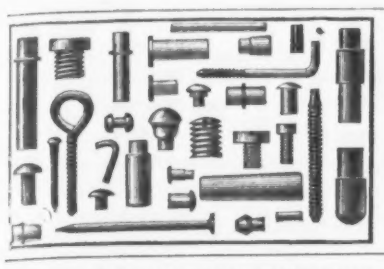

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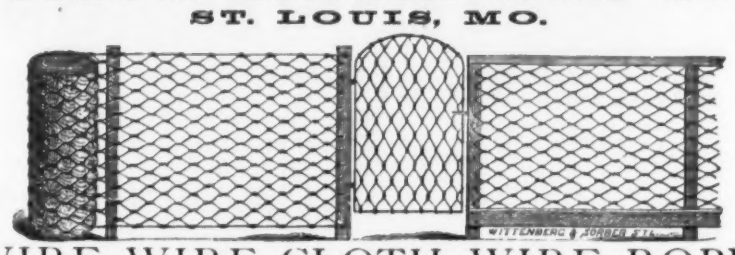

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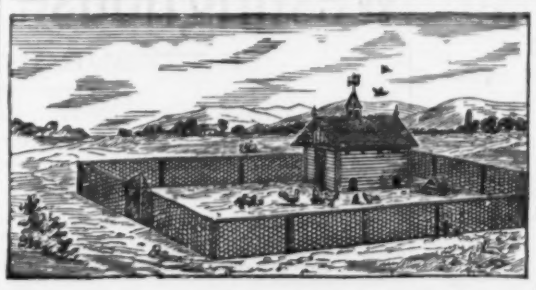

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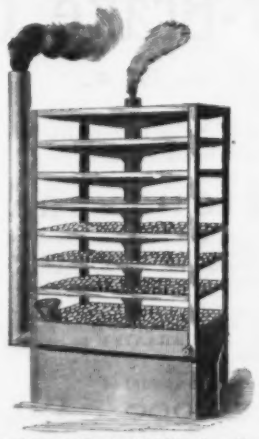

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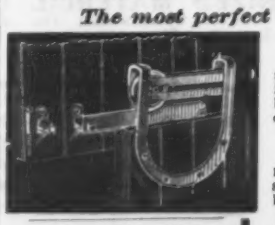

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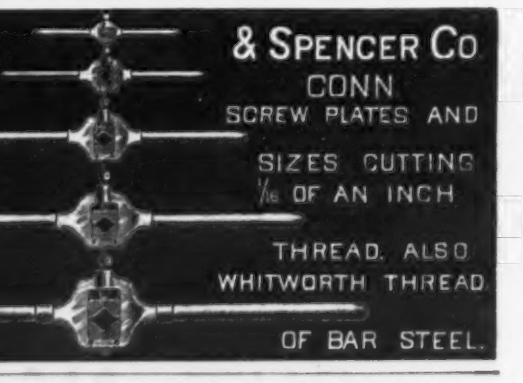

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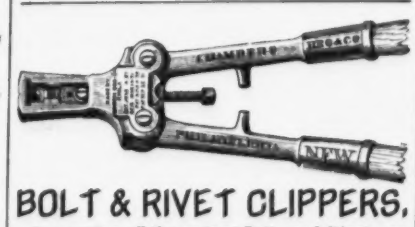

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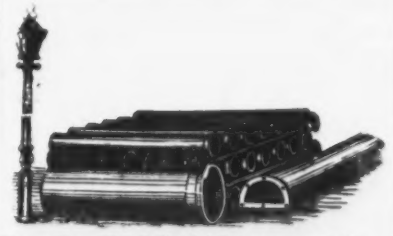
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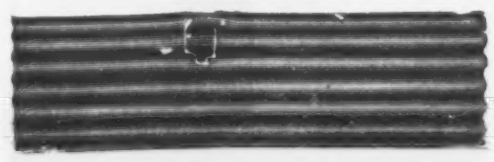
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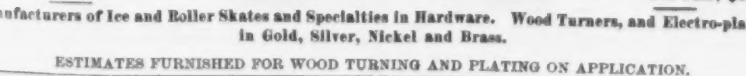

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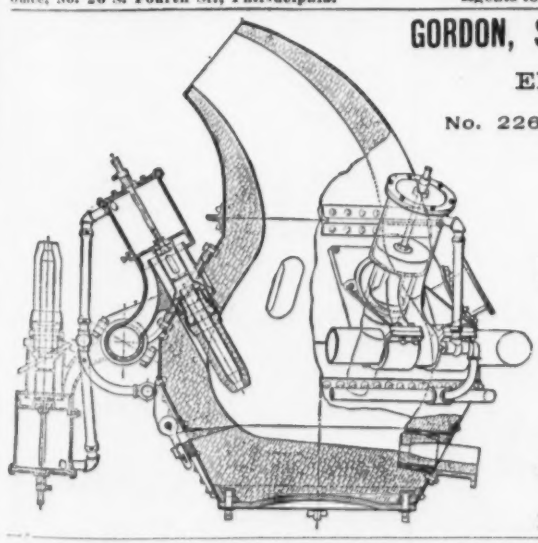
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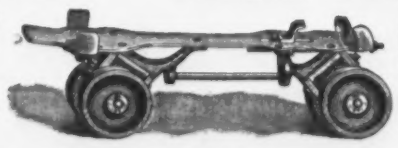
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LATEST LEGAL DECISIONS.

USURY—BURDEN OF PROOF ON BORROWER.

To a bill in equity to foreclose a mortgage the debtor set up the defense of usury to defeat the suit. In seeking to establish his defense the defendant gave evidence which was not clear or definite, and the trial court decided against him on the ground that his testimony was not satisfactory. The case—Poppleton *vs.* Nelson—was carried to the Supreme Court of Oregon, where the judgment was affirmed. Judge Lord, in the opinion, said: "Usury is the main question involved, and is one which needs to be proved by clear and satisfactory evidence. The defense involves a forfeiture; it is considered an unconscionable plea, and must be strictly supported. The court requires clear and cogent proof, and will not accept vague inferences or mere probabilities, or resort to conjectures, to aid the defendant. The burden of proof is on him, and he must sustain his allegations by the clear preponderance of evidence."

STATUTE OF LIMITATION—BANK DEPOSIT.

Mrs. B. deposited with D. & Co., bankers, $5000 in 1869; in 1880 she demanded it, and was refused payment. In 1884 she brought suit and the bankers pleaded the statute of limitation. The plaintiff recovered, and the defendants carried the case—Branch *vs.* Dawson—to the Supreme Court of Minnesota, where the judgment was affirmed. The Chief-Justice (Gilfillan), in the opinion, said: "The legal relation of banker and depositor upon a general deposit, as this was, is in most respects that of debtor and creditor. By the deposit the latter parts with and the former acquires the title to the money deposited, and the one becomes indebted to the other. But, by universal understanding on the part of banker and depositor, there is a condition attached to the undertaking of the bank. It is not its duty, as it is that of an ordinary debtor, to seek the creditor and pay him wherever found; it does not undertake to pay, without respect to place, absolutely and immediately. There must be demand for the money to make it due. Therefore, the statute runs only from the demand."

INJUNCTION—REMOVAL OF TELEPHONE POLE.

I. brought suit to compel the removal of a telephone pole erected at the inner angle of the sidewalk forming the corner of two of the principal streets in New Orleans. The defense was made that the pole was constructed with State and municipal authority, for the purpose of supporting the wires used, and was necessary for the transmission of messages. In this case—Irwin *vs.* the Great Southern Telephone Company—the defendant succeeded on the trial, and the plaintiff appealed to the Supreme Court of Louisiana, where the judgment was affirmed. The Chief Justice (Bermudez), in the opinion, said: "The power of the State and of municipal corporations over public and common property, to regulate the use of it for purposes of public utility, is no longer a mooted question where no Constitutional rights are infringed. It is well defined to be the rightful authority which exists in every sovereignty to control and regulate those rights of a public nature which pertain to its citizens in common, and to appropriate individual property for the public benefit, as the public safety, necessity, convenience or welfare may demand. Citizens have, nevertheless, the right to complain of nuisances, but this they can successfully do only where the effects are not common to every person, but produce, by the invasion of some vested right, a special or particular damage to them as distinguished from the rest of the public. For injuries which are consequential—that is, the results of acts done within the scope of the power granted, arising from a proper exercise of the same, and which in no sense amount to an actual taking of property or divestiture of acquired right—no remedy can, however, be had. We are satisfied that the erection of this telephone pole was done after proper authority had been obtained, and with as little inconvenience as possible to the plaintiff and to the public, and that, if the construction and use of the pole is an actual nuisance at all, it is such as does not materially interfere with the comfortable enjoyment of the plaintiff's property, and as causes little or no harm or injury to any one, which is easily bearable, and which has to be endured in view of the great public service which the use of it renders.

SALE OF GRAIN—DELIVERY—STORAGE—SHRINKAGE.

G. bought of A. 9000 bushels of corn and paid for it in advance. The contract was made in March, 1881, and the corn was to be delivered on or before May 1 following, at Exira. When the corn was weighed out in the fall it fell short by reason of the shrinkage. A. claimed that as the corn had been delivered the loss was G.'s, but G. denied that there had been any delivery. The contract provided that the defendant was to deliver "6000 bushels of good, sound, merchantable corn in crib at Exira, and 3000 bushels additional in like condition." A. had at this time in crib at Exira about 6000 bushels of corn, which G. made some examination of and some rough measurement and estimate of the quantity. A. insisted that the corn in the crib, 6000 bushels, was then delivered, and that in making the delivery of the balance any shrinkage by the fall should be credited to him. A refusing to deliver the quantity demanded by G., he sued him for breach of contract, and claimed as his damages on the corn not delivered the difference between the contract price and the highest market price between the 1st of May and the commencement of the suit. In this action—Gilman *vs.* Andrews—the plaintiff recovered his full claim, and the defendant took an appeal to the Supreme Court of Michigan, where the judgment was affirmed. Judge Adams, in the opinion, said: "We think the corn in the crib, about 6000 bushels, was not delivered. There was nothing in the contract to so indicate, but the contrary. It did not call for specific corn, but corn of a given quality. It appears to me that the defendant could have discharged his obligation by delivering to the plaintiff any corn of the given quality before the first of May following. If the corn in the crib had been under-

·.· A. H. McNEAL, ·.·

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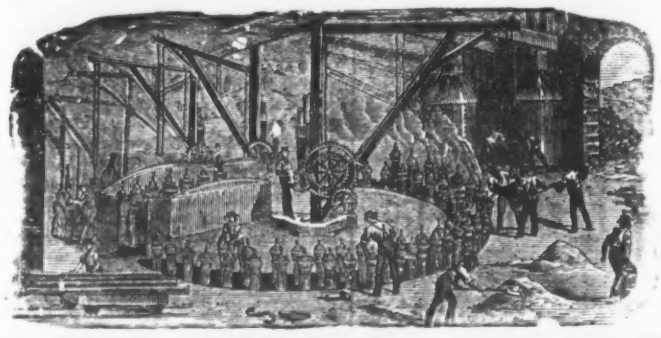

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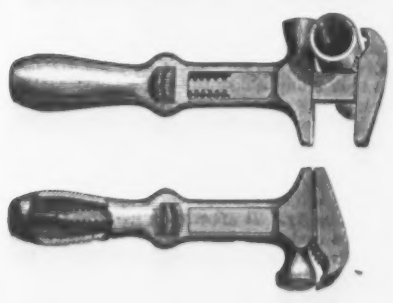

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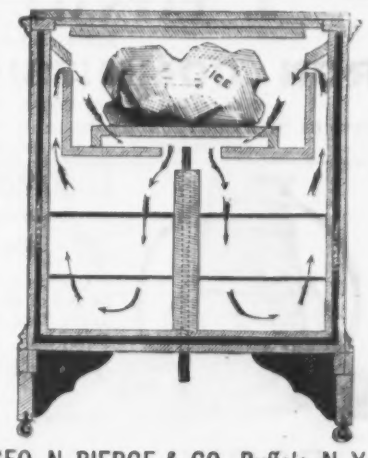

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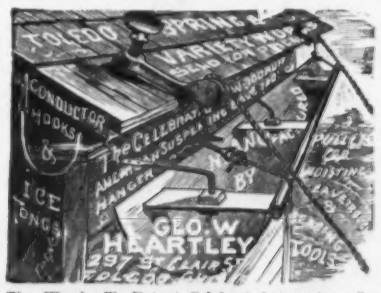

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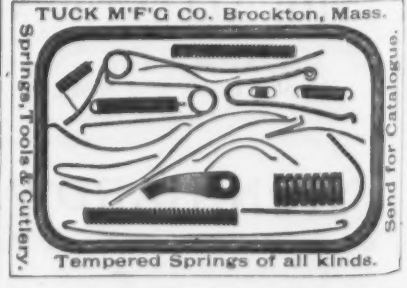

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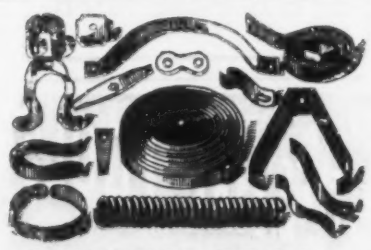

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BLASTING POWDER and ELECTRICAL BLASTING APPARATUS. MILITARY POWDER on hand and made to order
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Pamphlets showing sizes of grain sent free.

NEW MAKE OF MINE LAMP.
THREE DIFFERENT SIZED SPOUTS
SEAMLESS BRASS COLLAR.
BRASS HINGE, Solid Lid.
NO SOLDERING
THE HINGE CANNOT MELT OFF.
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PUMPS, HYDRAULIC RAMS, GARDEN ENGINES,
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

FIG. 120. FIG. 209. FIG. 70.

Wrought Steel Sinks.

One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.
The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.
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FIG. 114.

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Single and Double Acting Spring Hinges,
Union Coil Door Springs,
Galvanized Pump Chain,
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Wooden Well Curbs, Wood Tubing,
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Frictionless. Indestructible. Perfect. Send for Circular.
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stood by the parties as specifically sold and delivered, it would have been unnecessary to describe it as of any given quality. We are well satisfied that the parties understood the corn was to be weighed. It was to be paid for by the bushel, and there is no pretense that the plaintiff had any means of knowing how much there was, except, it may be, approximately by estimate. The defendant, as we understand, proceeded to add immediately to the mass in the crib, without informing the plaintiff. So when in the fall the delivery was made it is clear that the grain had to be weighed, for no settlement could otherwise be made. There was therefore no delivery under the contract until the weighing out in the fall, and if there was any shrinkage prior to that time we do not think the defendant should be allowed for it. As to the damage, the claim of the plaintiff is the proper rule."

FIRE INSURANCE BY GENERAL ASSIGNEE—EXISTING INSURANCE.

S. was made the assignee for creditors of a stock of goods and store fixtures. Before he had filed his bond, and thus perfected his appointment, he took out a policy on the property. In doing this he surrendered one of the policies of the assignor, the interest in all of which, by operation of law, came to him. The amount of his policy did not exceed his interest in the property, but with the outstanding policies the insurance was greater than the value of the goods and fixtures. The property was destroyed on February 5, 1884, and, two days later, S. filed his bond. The company refused to pay on two grounds: 1. That S. had no title, not having completed his qualifications. 2. That he had no insurable interest by reason of the double insurance. In the suit brought —Sibley *vs.* Prescott Insurance Company—the plaintiff recovered, and the company took the judgment to the Supreme Court of Michigan, where it was affirmed. The Chief Justice (Cooley), in the opinion, said: "1. The acceptance of the assignment and taking possession of the property created a trust, and he could protect the property and enforce any claim by suit before giving his bond. 2. He could take out further insurance, subject to the customary conditions as to information, overvaluation, &c., and therefore his new policy was not void."

The Protection of Inventors and the Aniline Industry.

Dr. Perkin, in his presidential address before the Society of Chemical Industry, has furnished a striking example of the importance to a country of protecting its inventors fully. Dr. Perkin says:

The fact that Germany is now the headquarters of this industry raises the important question, Why has England allowed this state of things to come about? All the raw materials are produced in this country, both the products from coal and the other chemicals required, and, as we have seen, the industry originated and was first carried on here, and, in addition, we are the greatest consumers of the coloring matters. This fact is well worth considering, and it is many-sided. In my opinion, the Patent laws, and the difficulty of preventing infringements from abroad, was one cause which may have prevented this country from maintaining its first position. When speaking of the early history of the first coal-tar color—mauvein—I referred to this class of infringement and how it was first met by the proceedings taken against the agents employed in this country, and this course was so far successful, but only pointed out how easily the law could be evaded if foreign manufacturers gave up responsible agents and sold direct to the consumers. Having no duties on such articles, no assistance could be obtained at the customs, and the coloring matters were generally declared under the name of vegetable dyes or extracts, so that it was impossible to stop them entering the country, and even when found, owing the onus of proof of their being manufabtured by the patentee's process laying with the patentee, an almost insurmountable difficulty was raised, as in most cases no traces of the products used in the preparation were left in the coloring matter. The only other proceedings which could be instituted were against the consumer; here again the difficulties were practically insuperable. In most cases the consumers were using the patentee's product to some extent, and it was impossible to know to what extent; in fact, without going into the many details connected with this point, it may be assumed that in most cases proceeding against a consumer of this kind of article is detrimental and practically useless. The result of this infringement, by importation from abroad, is that a patentee had to compete against all other manufacturers with the exception of his own countrymen. There can be but little doubt that this state of things has had much to do with preventing the development of this industry, and crippling enterprise in this country, as it prevented manufacturers even from working under royalties, there being no security whatever except in name. Again, the fact that a foreigner could take a patent in this country, manufacture in his own country, and send the product here, was a great source of loss and mischief to our trade. The new Patent laws may probably alter this, but still the difficulty of importation in defiance of patent right still remains.

There is another matter which tells much against this country—namely, that we are not able to export color to foreign countries upon the same conditions as foreign manufacturers can into this, because we are met with import duties which handicap us to a prohibitive extent, whereas the foreign manufacturer, being protected in his own country, may maintain his prices there and sell at a lower price in this country; but, what is still more injurious, he may dispose of surplus production in this country at or even below cost price. The injurious effect of such a course upon our market can be easily understood by business men, and I need not go into it here. These are matters our manufacturers have to contend with, and cannot help themselves; there is, however, one matter in which they are undoubtedly at fault. We find that in Germany the manufacturer understands the value of well-trained chemists, and sympathizes with them; they also realize the value of theoretical chemistry; this is a condition of things we do not find in this country. Unless I am mistaken, the coal-tar color industry has acted as the great stimulus to the development of general chemical industries of Germany, and these, by starting with so much scientific aid as they have called to their assistance, have made an amount of progress during the last 25 years which is most remarkable. Up to that time England had been the seat of most of the large chemical industries, and the success which we have had appears to me to have produced a feeling of false security, and more attention has been paid by the heads of firms to the markets than to the chemistry of their manufactures.

Newspaper Statistics.

A correspondent of *Le Figaro* has compiled some interesting statistics as to the total number of newspapers and other periodicals published in every part of the world, and he brings the total number up to 35,000, thus giving one to every 28,000 inhabitants. Europe, according to his calculations, has 20,000 newspapers, Germany coming first with 5500, of which 800 are published daily, the oldest being the *Post Zeitung*, published at Frankfort in 1616, while the one with the largest circulation is the *Berliner Tageblatt*, which prints 55,000 copies. Great Britain comes next, with 4000 newspapers, of which 800 are published daily, while France has 4092, of which 360 only are daily. Italy comes fourth, with 1400 newspapers, of which 200 are published at Rome, 140 at Milan, 120 at Naples, 94 at Turin, and 70 at Florence, the oldest being the *Gazetta di Genova*, first published in 1797. Twelve hundred newspapers are published in Austro-Hungary, of which 150 are daily, the most remarkable of the Austrian journals being one called *Acta Comparationis Literarum Universarum*, which is a review of comparative literature, with contributors in every part of the world, each of whose articles is printed in its native tongue. Spain has about 850 journals, of which a third are political, and Russia has only 800, of which 200 are printed at St. Petersburg and 75 at Moscow. Several of these journals are published in three different languages, and there are also 4 published in French, 3 in German, 2 in Latin and 2 in Hebrew, besides several in Polish, Finnish, Tartar and Georgian. Greece has upward of 600 newspapers, of which 54 appear at Athens, while Switzerland has 450, and Holland and Belgium about 300 each. There are 3000 journals published in Asia, of which no fewer than 2000 appear in Japan; but in China the only newspapers not published by residents at the treaty ports are the *Ning-Pao*, an official journal published at Pekin, the *Chen-Pao* and the *Hu Pao*, published at Shanghai, and the Government journal which was brought out in Korea last year. There are three newspapers published in French Cochin China and one in Tonquin—*l'Avenir du Tonkin*—the rest of the newspapers credited to Asia appearing in India, with the exception of 6, which are published in Persia. Africa can boast of only 206 papers, of which 30 appear in Egypt, and the remainder in the colonies of England, France, &c. The United States possess about 12,500 periodicals, of which 1000 are published daily, the oldest being the Boston *News*, which was first published in 1794. Among the United States journals there are no fewer than 120 edited and published by negroes, the oldest of these being the *Elevator*, which was brought out at San Francisco about 18 years ago. Canada has 700 newspapers, a considerable proportion of which are published in French; and in South America the Argentine Republic comes first, with 60 newspapers. Australia has 700 journals, nearly all published in English, and the Sandwich Islands 8, of which 5 are in English and 3 in the native tongue. Out of the 35,000 periodicals enumerated above, 16,500 are in English, 7800 in German, 6850 in French, 1600 in Spanish and 1450 in Italian.

Nitro-Gelatine.

We referred, says the *United States Army and Navy Journal*, to the Nordenfeldt experiments with gelatine for the bursting charges of armor-piercing shell in our issue of last week. We have since learned a few details of the work recently done in this direction by the Naval Ordnance Bureau, the results of which are considered as very promising. The explosive used at Annapolis is gun-cotton, the liability to accident from shock being eliminated by an excessive percentage of moisture. The explosive combustion of the bursting charge is obtained at a desired moment by means of the gunpowder fuse developed at the naval proving grounds, referred to in the last report of the Secretary of the Navy. Enumerating the experiments briefly in the order of their occurrence, spherical cast-iron shells of 15-inch caliber, and 8-inch and 10-inch muzzle-loading rifle common shells, containing charges of from 5 pounds to 7 pounds of gun cotton, carrying 30, 40 and 50 per cent. of water, were successfully detonated in an explosion chamber. A target was then constructed of six 1-inch wrought-iron plates, backed by 10 inches of oak, against which were fired steel armor piercing projectiles charged with gunpowder, and others with gun-cotton, carrying 50 per cent. of moisture, from the Hotchkiss 6-pounder rapid-firing gun, at a velocity of 1900 f. s. The gunpowder charged shells —which were unfused, the intention being to develop explosion by the heat of impact —burst at a mean penetration of point of 8 inches. The gun-cotton shells—likewise unfused—with 50 per cent. of water, reached a point penetration of 11 inches and did not explode. Explosion with 9 inches penetration occurred with gun-cotton bursting charges containing 40 per cent. of water. Lastly, gun-cotton shells containing 50 per cent. of water provided with the exploder and a "delayed action" percussion fuse were fired through 3 inches of wrought iron, and reached a penetration of 5 feet into dry sand before explosion. These interesting results would seem to indicate that for work against armor a notably greater penetration

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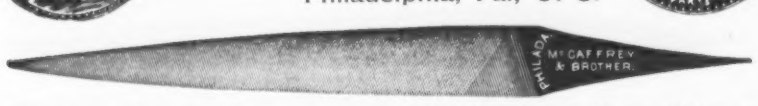

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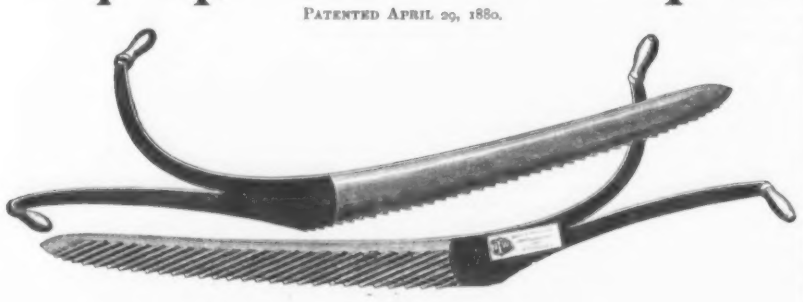

This Knife has been tested with the most celebrated Knives of other makers, and has proved an easier and faster cutter than any other. Its special excellence consists in the chisel-edge tooth, shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or for any other work for which a Hay Knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once, and a new chisel tooth appears. It can ordinarily be sharpened by a common scythestone. Try one, and you will give it the preference. *First Premium awarded by Maine State Fair Association, September,* 1884.

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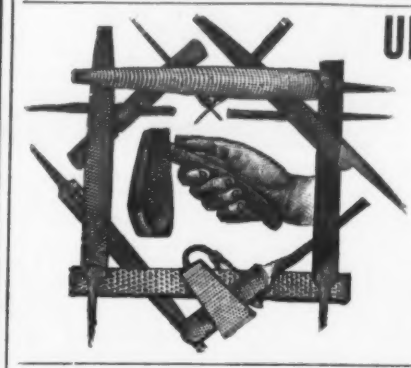

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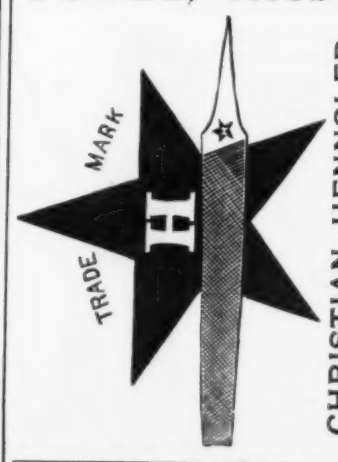

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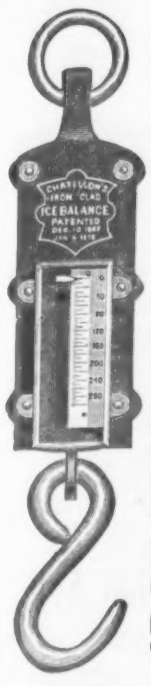

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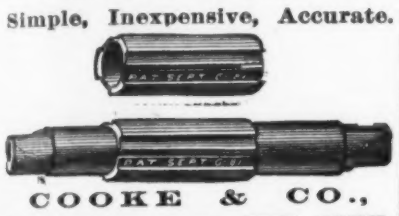

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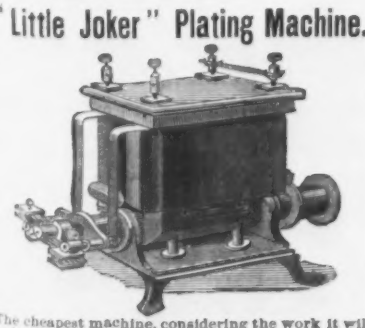

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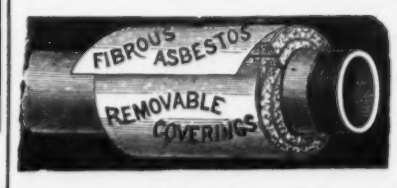

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may be obtained with wet gun-cotton bursting charges, with the attendant enhanced destructive effects, than with gunpowder. It is said the Naval Bureau has directed experiments in this direction to be made with a high power 6-inch gun against steel plating of from 5 to 10 inches thickness, the results of which cannot fail to be of great interest to ordnance officers.

Steel Castings and Forgings.

Mr. Jeremiah Head, president of the British Institution of Mechanical Engineers, states that steel castings began to come into extensive use about 23 years since. They were then made of crucible steel only, and no great size or weight was attempted. An urgent need had long existed for a material which could be cast in a mold, and which should yet have the toughness and tenacity of wrought iron. Portions of machinery that are subjected to severe strain, such, for instance, as the pinions and clutches of reversing rolling mills, and the propelling gearing of steam-plow engines, are cases in point. No increase of substance would give the requisite strength, so long as the material remained cast iron, inasmuch as the destructive force depending on the inertia of the parts would increase proportionately. But the difficulty was entirely obviated by the use of steel castings; for the strength and toughness in that case are largely increased without increasing the inertia. Before the time named, articles of enormous weight, such as screw propellers, were occasionally made even of cast brass or gun metal at a twelve fold expense compared with cast iron, in the hope of obtaining a slight increase of tenacity and some little ductility. The modern alloys of manganese and phosphor bronze, and Dick's metal, which in some forms are claimed to be as strong and tough as wrought iron, were then unknown; and therefore the need of a better material for castings was more urgent than it would otherwise have been. The cost of steel castings has been greatly cheapened latterly by the employment of the Bessemer and open-hearth processes. But the expectation which is occasionally expressed, that steel castings are about to supersede iron ones altogether, does not seem at all likely to be realized; for, in the first place, steel castings are from three to five times dearer than iron ones, and, in the second place, while their general superiority is beyond question, iron castings have still the advantage in certain respects. Steel castings are dearer than iron—firstly, because the value of molten steel is considerably greater than that of molten cast iron; secondly, because, in order to get sound castings, there must be very much more waste in "dead-heads" with steel than with iron; these are difficult and costly to remove, and entail a loss represented by the difference between steel-casting value and pig iron, which is greater than that between iron-casting value and pig-iron; thirdly, because the annealing process, without which steel castings are useless, is tedious and expensive; fourthly, because the higher melting point of steel compared with iron necessitates more costly molds. In consequence of these peculiarities the quantity of finished steel castings capable of being turned out in a given space, with a given number of hands and a given value of plant, is small compared with a corresponding output in iron castings. And as these impediments are mostly of a permanent character, the relative value of steel castings is not likely to be greatly altered in the near future.

As to those respects in which iron castings have the advantage: 1. Steel castings seldom, if ever, have the fine surface, sharp edges and pleasing appearance of good iron ones. This arises, no doubt, from the higher temperature of the molten metal in the former case and its destructive action on the surfaces of the mold. Annealing also usually detracts considerably from the appearance. 2. Both on the surface and internally steel castings are much more liable to cavities and blow-holes. 3. If not fully and equally annealed throughout, steel castings are quite unreliable and even treacherous. 4. The delay in obtaining steel castings, owing to the time required for annealing, is so considerable as often, in pressing cases, to compel the reluctant substitution of iron ones. Besides the points just raised there are many others which seem to force us to the conclusion that the art of iron founding is in no danger of extinction, or even of serious diminution. In a majority of the cases where cast iron has hitherto been used, mass, and the stiffness due thereto, are required, rather than great tenacity or ductility. For columns, water and gas mains, engine frames, cylinders, condensers, bedplates, lathe-beds, machine frames, bridge cylinders, railway chairs, household grates, roofing gutters,, rain-pipes, certain culinary utensils, cellar gratings and for very many other purposes, steel would not answer better than if indeed so well as iron, even though there were no difference in price. Again, for wearing surfaces, such as the motion blocks and bars of a steam engine, nothing works better than cast iron upon cast iron, if only the areas be sufficient; and this property is still more remarkable in the case of pistons in cylinders and slides on slide faces, working as they often do for long periods, and remaining in excellent condition, with no other lubrication than the steam itself. There is not, so far as I am aware, any evidence to show that steel castings would answer at all in such positions. There are indeed purposes for which the one material is fittest, and others for which the other is fittest. Time will show, but meanwhile nothing like the wholesale superseding of cast iron by steel is in the least probable.

Concurrently with steel castings, steel forgings have gradually been coming more and more into general use. For very fine and delicate work, such as the spindles and pinions of watches and clocks, high-carbon crucible cast steel has been used for an indefinite period, and long before the days of Bessemer or Siemens. Cost is nothing, homogeneity everything, in such cases, and capacity to harden is scarcely less valuable. A streak of cinder, of little moment in a large forging, might render a very small one weak at a vital point. Modern mechanisms tend more and more to comprise complicated parts machined into form out of solid forged lumps by a number of successive operations. A finished piece of this kind has perhaps slender projections whereof the soundness and strength are essential. The only way to make a forging of wrought iron suitable for such a purpose is so to work it that the grain of the iron shall follow each projection, as the woody fibers do in the stem and branches of a tree. This *desideratum*, however, is always difficult, and in complicated forms impossible to obtain. But steel has practically no grain, and is as strong in any one direction as in any other. Thus it is eminently suitable for such work, and is natarally superseding iron completely. A good example is afforded by the spherical sector pieces with shafts, forming the two principal revolving parts of the Tower engine. Several parts of the locks of rifles and machine guns, and of the breech-closing and discharging apparatus of heavy ordnance, are also cases in point. In making steel forgings the smith now starts with a cogged bloom, purchasable of any desired weight. These are simply ingots rolled down to a rectangular section and sheared off to a given length. They are the cheapest form in which wrought steel can be purchased. Indeed, the trade in soft steel blooms for miscellaneous purposes has lately increased at a surprising rate. Mr. Arthur Cooper, of the North Eastern Steel Works, Middlesboro', states that about 900 tons per week is his present output of basic steel blooms and billets and exclusive of rails. Half of this is used for wire making, and the other half for tin plates, stamping sheets, tube strips, boiler plates, angles, forgings, nails, locks, hoops and sleepers.

With regard to gun and rifle barrels, a complete revolution has taken place within the last few years. The system of coiling and then welding wrought iron strips to form a barrel has virtually passed away, and solid steel, rolled from the ingot, and then drilled through from either end, is the system which now prevails both here and abroad. A similar change has taken place with respect to heavy ordnance. The imposing operations of coiling wrought-iron bars of large section and enormous length, and then welding them under a colossal steam hammer, are no longer to be seen at Woolwich. Every part of every piece of ordnance is now made of steel, and all guns are breech-loading. This revolution has only taken place within the last three years, the decision having been arrived at on Colonel Maitland's recommendation, after he had visited various foreign works and arsenals and satisfied himself that there could no longer be any doubt as to the absolute necessity of the change. But there are certain specialties within the general class of forgings with respect to which it is by no means yet clear that steel is superior to wrought iron. I refer to heavy shafting, axles, and especially locomotive crank axles. Let us consider the last first. No one can view an express train dash by at full speed without feeling that the passengers are, as it were, "carrying their lives in their hands." The train is made up of a great number of parts, all of which are liable to breakage, and the failure of some would inevitably lead to terrible disaster. In this sense perhaps the most important detail in a train is the crank-axle of the locomotive. There are many and diverse opinions among engineers as to crank-axles. Some prefer them of iron, some of steel, and some think they should be avoided altogether by the adoption of outside cylinders. On several of our leading English lines, and notably on the Great Northern, express engines have now plain axles throughout. But on other lines crank-axles are used in all types of engines, and on all lines they are used in some types which are liable to be run at considerable speed. The Midland Railway at Derby takes elaborate precautions to prevent the breakage of crank-axles in the crank-pins and upper end of the crank-cheeks, where they usually give way, and to secure that, in case of fracture, they shall at all events hold together until the train can be stopped or a station reached. Each cheek of each crank is hooped, and each crank-pin has a bolt passing right through. All this is no doubt wise and commendable, and will prevent a certain number of disasters. But the very earnestness of the efforts to meet the danger is obviously a recognition of its existence, and so it tends to augment as much as to allay the prevalent apprehension that crank-axles in locomotives are, after all, dangerous things.

The board of trade returns for 1884 confirm this view in a very remarkable manner, and show also beyond a doubt that steel in crank axles is thus far less reliable than iron. During last year 385 axles of all kinds failed, involving death to 24 and injury to 73 persons. Of the 385 failures, 200, or 52 per cent., were locomotive crank or driving axles. The average mileage of the iron crank axles was 216,333 miles, and of the steel ones 173,287 miles, or 20 per cent. less. The question arises, If crank-axles cannot be altogether avoided in locomotives, how can they be strengthened at their known weak points? The distance between the wheels of a locomotive is fixed by the gauge of the rails. Between them, and within the main bearings, must come the two cranks, and these must be a certain distance apart to suit the cylinders and slide chest. Deep cranks, with cheeks of limited thickness thus involved by the exigencies of the situation, cannot be bent into form, as would be otherwise preferable; and there is no alternative but to cut them out of the solid. No fiber can be developed round the crank during forging, and therefore (at all events in the case of iron) the metal at and near the crank-pins is naturally less reliable than in the straight portions of the axle. The obvious way to compensate for inferiority of quality is to add to quantity. This cannot be done in width across the crank, for reasons already named, but there is nothing to prevent increase of depth through the crank. Judging from recently published drawings of locomotives, crank-pins appear to be habitually made only a trifle larger in diameter than the plain parts of crank-axles. Now if the strain on the crank-pin were merely a shearing strain or a short bending strain, as it is on the crank-pin of an outside-cylinder engine, this would be more than enough. But it is not so. In running round a curve, one driving wheel goes faster, and

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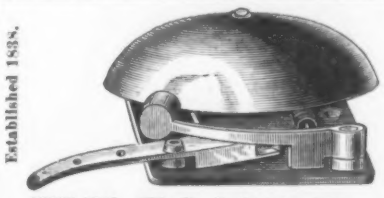

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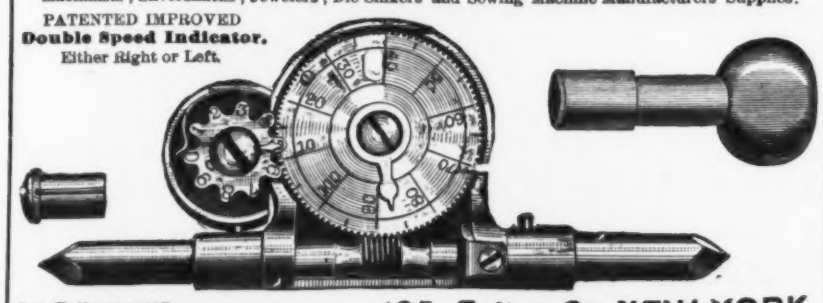

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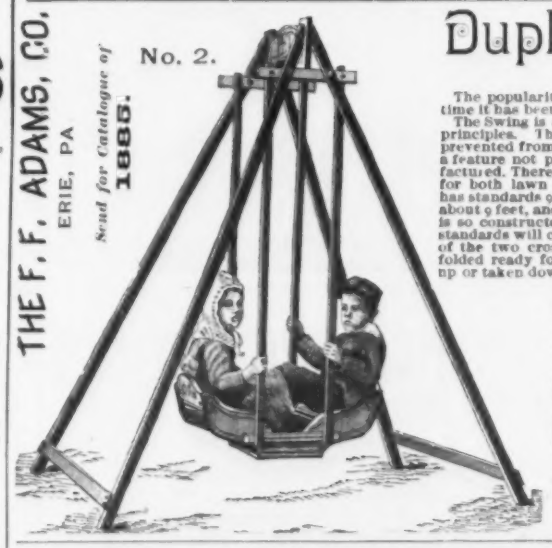

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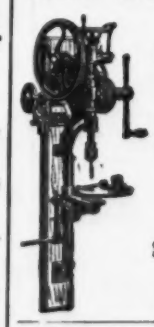

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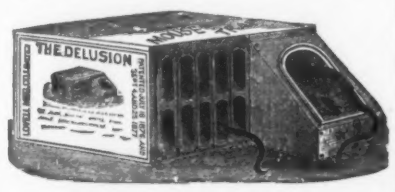

The Mouse goes in to get the bait
And shuts the door by his own weight,
And then he jumps right through a hole
And thinks he's out; but, bless his soul
He's in a cage, somehow or other,
And sets the trap to catch another.

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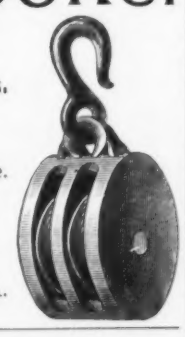

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the other slower, than they should to roll on their respective rails. The whole force of adhesion acts on the tire of one wheel in one direction, and the other in the other, tending with the leverage of the radius of the wheel to twist the axle. If there were bearings close to each cheek of each crank, there would then be only a shearing strain on the crank-pins; but as it is, the axle springs at the gaps, until the twisting strain on the pins is equal to that on the plain parts. The same thing occurs alternately when each piston, being at half-stroke and therefore making maximum rotary effort, is driving the opposite side wheel through the opposite side crank-pin, which is then on the center. Another strain to which locomotive crank-axles are liable is the nipping strain arising from the side-to-side oscilations of the engine. It is clear that these incalculable strains, alternately closing and opening the gaps, tend to break the cheeks at a point just below the pin. It thus appears that the crank-pins of a locomotive crank-axle are subjected to torsion strains equal to any other part of the axle. They are also subject to diminution by wear, and are under the disadvantage of being hidden from inspection by the connecting-rod ends when at work. The crank-cheeks at their outer ends are subject to greater strains than elsewhere; and at these severely-strained places the metal, for want of sufficient work and of a right kind during construction, is likely to be inferior. We might therefore expect *à priori*, that failures would mostly occur at these places. And such is the fact. The obvious remedy appears to me to be to make the crank-pins not about the same size, but very considerably larger than the rest of the axle, and to broaden out the crank-cheeks to suit. The crank, comprising the pin and cheeks, would thus be formed on the principle of a cramp or punching bear, in the sense that the material would be most thickly accumulated round the deepest part of the gap. The increased revolving weights could be easily balanced on the wheels, and the boiler raised if more clearance were required. Cheek straps and through bolts could still be added as a precaution. Such a change would, I feel sure, largely augment the average life of locomotive crank-axles, and increase the general confidence in their reliability.

As to heavy shafting, it is still an open question whether steel or iron is best. The preponderance of opinion among forge-masters in the North is, I think, decidedly in favor of iron. The price also is substantially lower. It is said that a steel shaft having a slight nick or fault across a journal will break or tear right through when strained; whereas an iron one, being built up in layers, usually remains unaffected beyond the immediate locality of the fault. Mr. A. C. Hill, president of the Cleveland Institute of Engineers, informs me he has been compelled to abandon the use of steel crank-pins in his shunting engines because they so frequently broke short off and he has obviated the difficulty by using Low Moor iron. This agrees with my own experience in all cases where there is heavy strain with shock. I have repeatedly tried soft steel, containing under 0.1 per cent. of carbon, for the wearing faces of the clutches of reversing rolling mills; also for bolts uniting the two halves of a heavy clutch. In both cases steel had to be abandoned, the greatest reliability and endurance being obtained from iron forged from piles of carefully selected bar and scrap. Most users and makers of steam hammer piston-rods also advocate iron. They say it is less likely to break, and moreover can be repaired by welding when it does give way. Some forgemasters are now habitually making forgings of steel scrap. But they are obliged to work within a much narrower range of temperature than in the case of iron; and there is a greater risk of flaws from imperfect welds. Others prefer half steel and half iron scrap. The formation of the requisite cinder for protecting the surface during welding is assisted by the use of a flux of silica and lime. Hammer rods, however, made in this way, cannot be so easily repaired as those made of wrought iron. Whether they be of iron or of steel, hammer-rods always give way eventually. Their duration is no doubt largely influenced by the mode of attachment to the head, a certain amount of freedom being very advantageous. Where this point is attended to, my own experience is that good results may be obtained from steel. For heavy shafting I have had about an equal proportion of failures in steel and in iron.

Electricity for Street Cars.

The most recent development in England of electricity as a motive-power for street-car propulsion has resulted in what is at present a failure on its first practical application to actual traffic requirements. This system is the invention of Mr. Holroyd Smith, of Manchester, the chief feature of which is that the car is not burdened with accumulators, but picks up its electricity for driving as it performs its journey, the electricity being generated in a fixed station at some convenient point on the line. For this purpose the track is constructed with a central underground channel, having a narrow slit in its surface, for communication between the electric motors in the car and the electric conductors within the channel. Two conductors are provided which convey the positive electricity, and the return is made by means of the rails, which are electrically connected one with the other. Communication with motors on the cars is affected by means of a collector which runs upon the conductor within the channel, and is connected by insulated copper bands with an electrical terminal underneath the car. This system has been laid down at Blackpool for propelling cars along the promenade, a distance of 2 miles, and recently, a portion of it was gone over by the Board of Trade inspector, the cars being run along a short length of the line, but the result was not sufficiently satisfactory to secure the usual license from the Board of Trade for the public working of the line. The failure, however, has not been due to any imperfection in the electrical means for driving, but to the manner in which the line has been laid down. From an inspection of the central channel, which, of course, is the source of the motive-power there would, however, appear to be considerable risk of this becoming so frequently choked up with dirt, stones or other material as to seriously interfere with the regular working of the car.

English Letter.

(*From Our Regular Correspondent.*)

LONDON, August 10, 1885.

THE WEEK

has been emphatically dull in all respects, and I have again to complain of a shortness of what I may term "raw materials." At the same time the world is going on very much as before, and thousands of careworn men are trying to forget all about iron and steel at the seaside or at other holiday resorts. The weather has been broken by high winds and thunderstorms during the week, and these have done some damage here and there, although in a general way I fancy the rains have done more good to the root crops, pastures, &c., than harm to the cereals. Speaking as one having a large garden, I can see nothing but good from the (to me) very welcome showers, but I learn that the farmers are not satisfied, albeit there is a consensus of opinion that the wheat crop is of almost uniform excellence in all parts of the country. The oats and barley have been ripened prematurely on the light soils by the excessive heat, and the grains are said to be shriveled up instead of being plump and full. On the whole, however, I think we have good reason to be satisfied with the season so far, and there is little doubt that the farmers and all who depend upon them will be benefited by 1885 as a whole. Money must be circulated in the realization of the crops, and the bounty of nature cannot fail to do something in the way of restoring prosperity to the country. It must be remembered, too, that we had a splendid summer and harvest in 1884, and that 1883 was by no means a bad year. Thus, we ought now to be getting rid of the long succession of wet summers and bad crops, and ought shortly to be again on the high road to better trade and greater enterprise. There are those among us who hold that the fall will not fail to bring symptoms of this incipient revival. Let us hope this may be the case, yet one cannot avoid seeing that we have as yet no evidence whatever of that nature. On the contrary, the Board of Trade returns which have reached me this afternoon (too late to be dealt with at great length in this letter) show a decrease for last month of about £2,000,000 in the imports, and much over £1,000,000 in the exports—more especially in the exports of iron and steel. Current reports from the leading manufacturing centers are amply confirmatory of this state of things, so that, as I have already said, we have as yet no signs at all of the long-expected and much-talked-of revival.

The autumnal meeting of the Iron and Steel Institute will take place at Glasgow on September 1, 2, 3, 4 and 5, and promises to be a very successful gathering. An influential and numerous local committee has been formed to look after the creature comforts and enjoyments of the visitors. Many of the leading iron and steel works will be visited, as also the great shipyards of the Clyde, a colliery and one of the shale-oil distilleries. Some of the locomotive and marine engineering establishments, as well as various other works, will be opened to the inspection of the visitors, who will find plenty of interesting sights in and around Glasgow. The literature of the meeting will be plentiful, but unexciting, dealing with the utilization of blast-furnace gases, iron and steel manufacture, the basic process and ancient and modern tin-plate making. I do not anticipate exciting discussions, and fancy most of the visitors will mainly "look about them."

THE IRON MARKET

remains exceedingly quiet, the usual August vacations having emphasized the previous dullness in almost all directions. At Glasgow the pig-iron market has been quieter this week, and no great amount of business has taken place in warrants, which closed at 41/6 ℔ ton. In special brands of Scotch pig there is a little irregularity as to values, but in a general way they have not undergone any improvements. The reserve stocks are still growing, and shipments are decreasing, so that the statistical position in Scotland cannot be said to be at all favorable. At Middlesboro' the market is very dull, and values have been depressed by the official returns for July, which show a larger make and a very heavy increase for the reserve stocks. It is obvious that the make is still too large for the wants of shippers and consumers; consequently, the "bears" have every assistance in keeping down prices. On the West Coast hematite pigs are for the most part unchanged on the basis of about 43/ for mixed lots in usual proportions. There, too, the surplusage is steadily growing larger. Elsewhere there is nothing special to note in connection with crude irons except that all values are nominal and in favor of buyers. Heavy manufactured iron is in moderate, but not brisk, request for engineering, structural, &c., purposes. Fencing wire is quiet and irregular in value. In galvanized sheets a considerable turnover is reported, but there is apparently no limit to the range of competition in prices. Ordinary finished iron is of late, all prices being nominal, and in the general demand mostly for common and lower medium sorts of bars, plates, &c. The sheet mills are probably best employed. Old materials are easy and in poor request at the subjoined rates for exports: Old double-headed iron rails, £2. 11/ @ £2. 12/6; No. 1 heavy wrought scrap, £2 @ £2 2 6; old iron boiler tubes, £1. 17/6 @ £2. 2/6; old leaf-spring steel, £2. 7/6, and old cast iron, £1. 17/6 @ £2, all free on board London or other good English port. Freights are unaltered, pig iron by ordinary steamer from Glasgow to New York being nominally 1/ ℔ ton. Other rates are as per recent quotations. At Liverpool there have been some large shipments of tin plates lately. One London firm alone has shipped 30,000 boxes in one week, and all to the United States.

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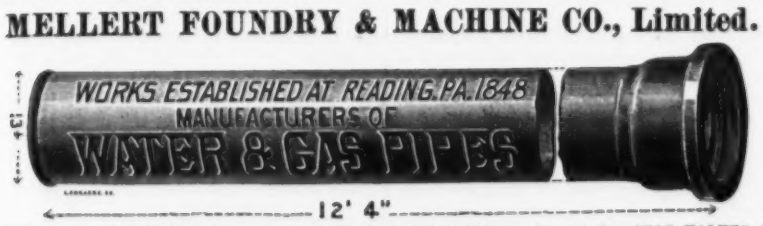

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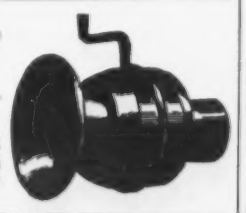

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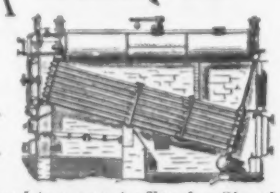

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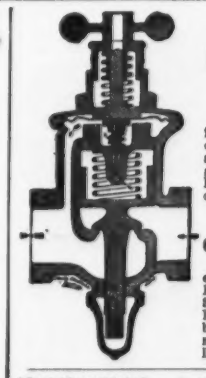

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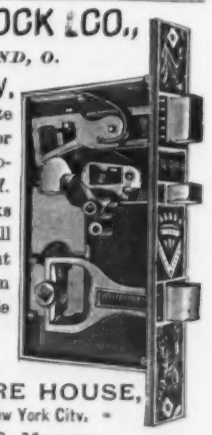

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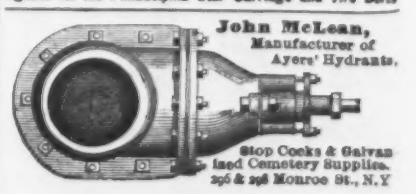

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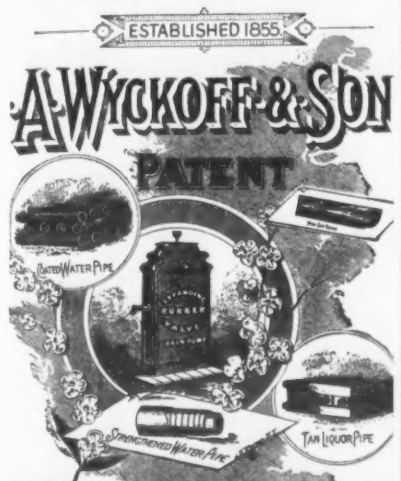

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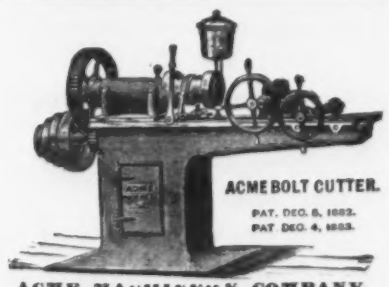

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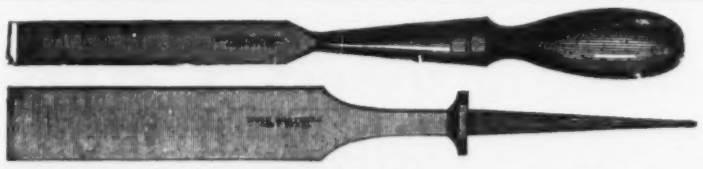

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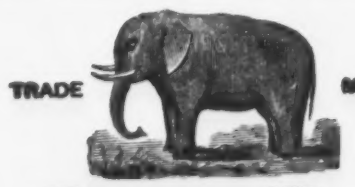

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The 4/ ₱ ton freight now charged from Liverpool, coupled with the low freights of the Stanelly and Swansea coasting steamers, which bring the plates round from these districts, enables the Liverpool liners to draw considerable cargoes, and to compete in a measure with the Swansea and Avonmouth direct steamers to America. Freight from the former place is now 8/6, and from the latter 9/6. The coasting steamers from Cardiff and Newport convey large quantities to the steamers loading at Bristol and Avonmouth. Steel is quiet, and our last week's quotations still apply. Steel rails remain at £4. 15/ ₱ton for ordinary heavy sections, and are not in strong request.

SCOTCH PIG IRON

is quiet, but fairly sustained in values at the moment, although there is really only a small turnover. Warrants are about the same in value as they were a year ago. There are 93 furnaces at work, against 95 a year since. In Connal's stores there are 612,673 tons, as against 586,991 tons this date 1884. The shipments to date are 67,777 tons behind those of last year, while the importations of Middlesboro' pig iron into Scotland are 67,868 tons more than in the same period of 1884. Current quotations are:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow	46/6	44/
Coltness, "	49/	46/
Langloan, "	47/6	46/
Summerlee, "	46/9	44/
Calder, "	....	44/
Carnbroe, "	46/	43/6
Clyde, "	46/	42/
Monkland, "	41/6	39/6
Quarter, "	41/	38/6
Govan, at Broomielaw	41/6	39/6
Shotts, at Leith	48/	47/6
Carron, at Grangemouth	51/	47/
Kinneil, at Bo'ness	44/	43/
Glengarnock, at Ardrossan	46/	41/
Eglinton, "	41/3	38/6
Dalmellington, "	43/	40/

MIDDLESBORO' PIG IRON

remains extremely dull, stocks having increased by 9000 tons during July, while the make was also 3000 tons more. Prices of G.M.B. pigs are as under, f.o.b.:

No. 1 Foundry	34/6	Mottled	31/
" 2 "	33/6	White	30/9
" 3 "	32/	Refined Metal	48/
" 4 "	31/9	Kentledge	35/
" 4 Forge	31/3	Cinder	30/

The official returns of the Cleveland Ironmasters' Association for July are as follows:

Make of Pig Iron.

	1885. July.	1885. June.	Inc.	Dec.
	Tons.	Tons.	Tons.	Tns.
Make of Cleveland pig iron, whole district	151,059	154,026	.....	2,967
Make of other kinds of pig, including hematite, spiegel & basic pig iron, whole district	60,287	53,942	6,345	..
Total of all kinds, whole district	211,346	207,968	3,378	....
No. of furnaces on Cleveland pig iron at end of month, whole district	73	72	1	....
No. of furnaces on hematite, &c., at end of month, whole district	24	26	.....	2
Total	97	98	.....	1

Stocks of Pig Iron.

	1885. July 31. Tons.	1885. June 30. Tons.	Inc.	Dec.
Makers' stocks of Cleveland pig iron, whole district	303,036	306,586	.....	3,550
Makers' stores of Cleveland pig iron, whole district	40,949	35,160	5,789	..
Pig iron in public stores:				
The N. E. R. Co.'s stores	11,747	11,647	100	.....
Connal's stores	60,282	52,732	7,550	.....
Total	416,014	406,125	9,889	.....

Shipments of Pig Iron from Port of Middlesboro'.

	Foreign shipments.	Coastwise shipments.	Total.
	Tons.	Tons.	Tons.
July, 1885	30,436	36,977	*67,413
June, 1885	35,512	41,557	†77,069
July, 1884	42,491	29,326	71,817
Decrease on June, 1885	5,076	4,580	9,656
Increase on July, 1884	.....	7,651	.....
Decrease on July, 1884	12,055	.....	4,404

* Including 1305 tons of pig iron other than Cleveland.

† Including 1633 tons of pig iron other than Cleveland.

NORTHERN MANUFACTURED-IRON TRADE.

Mr. Waterhouse, the sworn accountant to the Northern Iron Trade Board of Arbitration and Conciliation, has made the following return for the two months ended June 30th last:

Gentlemen: Having collected from the firms and companies belonging to, or associated for this purpose with, your Board the returns of their sales of manufactured iron during the two months ending June 30 last, and having verified the same by an examination of their books, I certify the average net selling price per ton to have been £4. 17/5. Beneath is a statement of the different classes of iron sold, and the average net selling price of each:

SALES DURING THE TWO MONTHS ENDING JUNE 30, 1885.

Description.	Weight invoiced.	Percentage of total.	Average net selling price ₱ ton.
	Tons. cwt. qrs. lb.		£ s. d.
Rails	597 14 2 16	0.96	4 12 4.49
Plates	37,118 7 2 5	59.58	4 16 6.98
Bars	13,980 9 3 22	22.44	5 4 0.39
Angles	10,603 0 2 18	17.02	4 11 11.93
Total	62,299 12 3 5	100.00	4 17 5.17

The following are the figures for the previous two months:

Description.	Weight invoiced.	Percentage of total.	Average net selling price ₱ ton.
	Tons. cwt. qrs. lb.		£ s. d.
Rails	498 10 2 15	0.76	4 14 10.92
Plates	33,368 8 3 20	58.77	4 17 5.51
Bars	14,575 11 1 13	22.33	5 3 10.11
Angles	11,840 19 1 25	18.14	4 12 3.88
Total	65,283 10 1 17	100.00	4 17 11.90

THE HARDWARE TRADES.

In London, on the whole, a better tone prevails, and, although orders are not very heavy or easy to obtain, there is not so much cause for complaint. At Birmingham the satisfactory harvest prospects now in part realized are favorably influencing the orders from the agricultural districts, more particularly in the eastern counties, and there is a steady increase from week to week in the volume of shipping orders, especially from India, Australia and South America. Continental orders are below the average, though reports are more satisfactory from the North of Europe than from other parts. The Cape mail this week is an improvement upon its immediate predecessors, and when the Bechuanaland question is fairly settled a decided revival of South African trade is hoped for. At Wolverhampton accounts of the condition of the plumbers' brass foundry trade vary, some makers reporting themselves fairly well to do and others as only quiet. The season for garden requisites is rapidly drawing to a close, and a fair business has been done. For plumbers' goods, beer engines and toilet fittings they are experiencing a steady call, Australia furnishing the bulk of the export trade. At Sheffield, except some trifling accessions of business in the country trade, resulting from the renewal of travelers' journeys, there is practically no change in the condition of the local industries. The formal close of the London season has not made much difference to the local houses which specially cater for the London shops. It has not been by any means a brisk season from a business point of view, but the leading firms continue to receive a good number of orders.

TIN PLATES.

In London the market remains practically the same as it was last week. Makers are still holding out for the rise, while buyers are not disposed to pay the higher prices. It is a question as to which can hold out the longest as to whether values advance or recede from their present position. As it is, very few orders are being placed, and many of the works are believed to be working for stock. I quote ordinary IC cokes—buyers, 14/; sellers, 14/6, f.o.b. Liverpool. At Liverpool there is not much change to report in the position. What little change there is to be noted is that there have been a few more orders placed, and a disposition on buyers' part to do a little further business at ruling figures. There is, however, almost a total absence of anything like further business, and there is absolutely nothing doing at higher figures. It may, however, be said with certainty that there have been more inquiries made this week and a few more orders placed, but they are mostly all specialties as to sizes and substances, and orders that come in more or less regularly. A great many of these were for Bessemer steel with coke tinning, and the prices for these still range from 14/6 to 14/9 IC for the Bessemers, and 15/ IC for the Siemens steels with coke finish, and 15/6 I C for the same in best coke finish. There has been also a little doing in ternes at prices ranging from 14/ to 14/6 IC. Coke tins continue very quiet, but there are occasional deals in odd lots at from 14/ to 14/6 IC. Business is slow in coke tin wasters, since 13/6 @ 13/9 is insisted upon. A good business might be done at 13/ or thereabouts.

The Comparative Wear of Coin.

In the annual report of the deputy master of the English Mint for 1884, just issued, there appears an interesting note by Mr. Hill, superintendent of the operative department, and Prof. Chandler Roberts, chemist of the Mint, as to the comparative rate of wear of coins of different metals and alloys. Experiments made by the same gentlemen on a former occasion pointed to the conclusion that differences in the mechanical treatments of coin affect the durability of such coins. They have now made experiments as to the effects on the wear of coins of extreme hardness. They coined 100 pieces in a variety of steel which was capable of receiving sharp impressions when soft, yet would harden energetically when rapidly cooled in water. Fifty of the coins were hardened after striking, and 50 left just as they came from the dies. The former lost an average of 0.0029 after 26 hours, and the latter 0.0032 per cent. when separate from each other. When the two lots were mixed together the soft-steel coins lost an average of 0.0077 after 52 hours and the hard ones 0.0042. According to the experimenters, these results show that the wear of steel against steel is considerable. In comparing equal times they say: "The amount of metal lost, even in the case of hardened steel, approximates closely to the loss sustained by coins struck in gold (standard 916.6) and silver (standard 925). A further objection to the use of steel coins is the destructive influence they would exert if allowed to mix freely with coins of other metals, and it is set forth that when 50 hard-steel coins and 50 silver coins were revolved together in a drum for seven hours the former lost nothing, while the silver coins lost an average of 0.046 of their weight, some of these coins losing as much as 0.0050. Experiments with coins of 25 per cent. nickel and 75 per cent. copper, the alloy usually employed for the coinage of nickel, showed that the loss was very small as compared with coins of pure nickel, being, after 13 hours, 0.0004 with the former and 0.0011 with the latter, thus demonstrating the advantage of the copper alloy.

The Alaska Commercial Company, in which Senator John Sherman has a large interest, was organized in San Francisco on a nominal capital of $2,000,000. It is locally assessed on personal property to the amount of $87,850, when the franchise is alleged to be worth at least $10,000,000, or $3,000,000 more than the United States Government paid to Russia for the whole of Alaska. The company have the right to catch seals on the Pribylov Islands to the number of not more than 100,000 a year, paying $2 for each skin taken and shipped, and in addition a rental of $55,000 a year. The average value of the skins is $17.50, giving a total income of $1,750,000 from this source.

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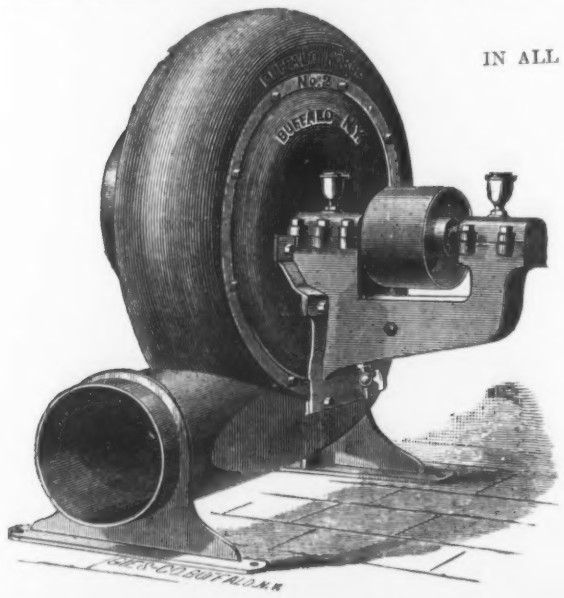
Buffalo Exhausters,



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WROUGHT IRON W.B. ASK FOR CIRCULAR OF OUR PHOSPHOR BRONZE SELF-LUBRICATING BUSHING FOR ALL KINDS OF BLOCKS & SHEAVES

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WOOD AND WROUGHT IRON BLOCKS FOR RAILROAD AND MINING WORK A SPECIALTY. LARGEST AMERICAN MANUFACTURERS OF WROUGHT BLOCKS. CATALOGUES FURNISHED AND SAMPLE ORDERS SOLICITED.

WESTERN PATTERN EXTRA RR MIDDLE STRAP WELDED TO NOSE

PERRY'S PATENT LAP LINK

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PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless Steel Shutters at Philadelphia 1876, Paris, 1878, and Melbourne, 1881.

CLARK, BUNNETT & CO., LIMITED,

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Original Inventors and Sole Patentees of

NOISELESS, SELF-COILING, REVOLVING STEEL SHUTTERS,

Fire and Burglar Proof. Also improved ROLLING WOOD SHUTTERS of various kinds, and Patent METALLIC VENETIAN BLINDS.

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"Champion" Locks.

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No. 91.

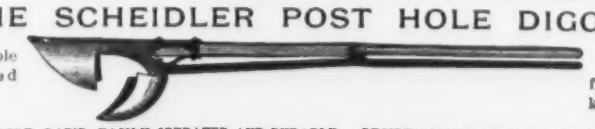
PADLOCKS, NIGHT LATCHES; Drawer, Closet and Chest Locks; Store Door Locks. Combination Locks for Drawer, Desk, &c. Keyless Cash Boxes.

FAIRBANKS & CO., Agents, *New York, Philadelphia, Baltimore, Pittsburgh and Buffalo.*

MILLER LOCK CO., Phila., Manu'frs.

THE SCHEIDLER POST HOLE DIGGER.

Makes a hole any desired size.



Works perfectly in all kinds of soil.

SIMPLE, RAPID, EASILY OPERATED AND DURABLE. DECIDEDLY THE BEST DIGGER MADE.

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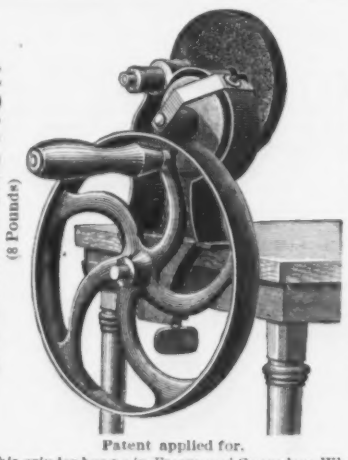
The $5 Hand Mill.

HAWLEY BROS. HARDWARE CO., 301 to 309 Market St., SAN FRANCISCO, CAL., Agents for the Pacific Coast.

COOK'S FRICTION (8 Pounds) EMERY GRINDER.



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This grinder has a 5-in. Emery and Corundum Wheel. Runs easily to required speed, viz. 47 0; is light, weighing but 8 lbs.; small, occupying but little room; can be used wet or dry; is well made, the frame and wheel of charcoal iron with a hard-rubber friction pulley which can instantly be adjusted to any required tension; spindle, steel, and is just the article for grinding house and shop tools of every description. For prices address

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Style of Medium-Size "Easy."

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Largest Iron Fence and Railing Works in U. S.

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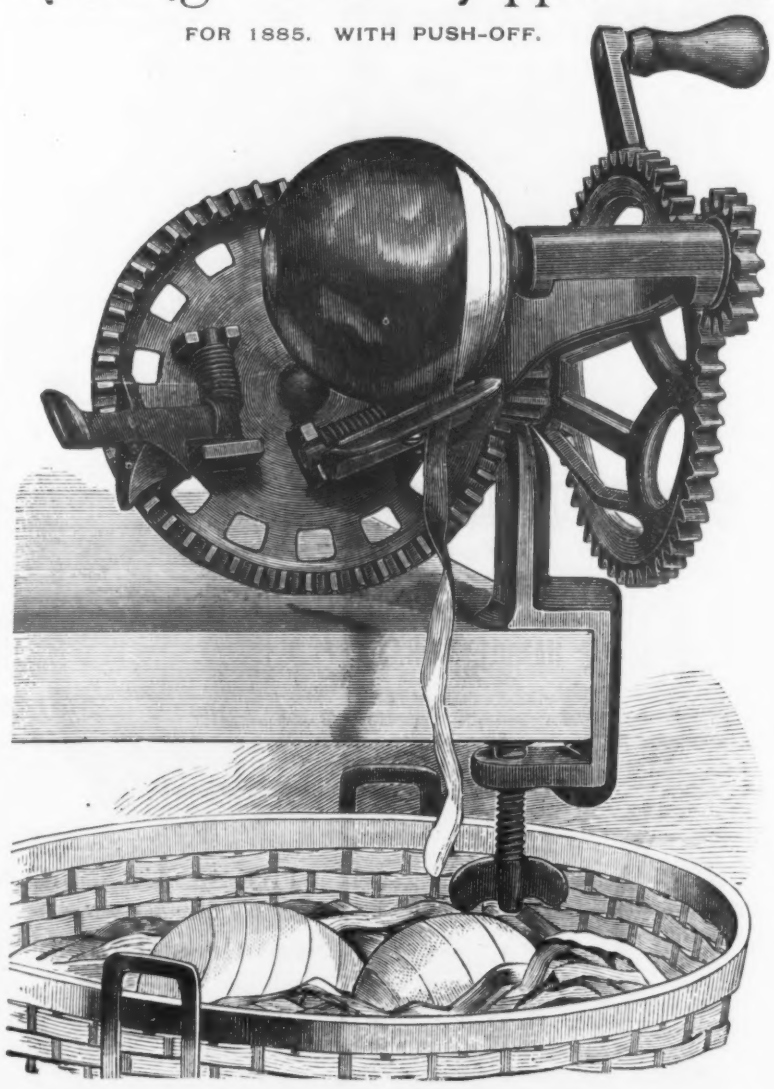

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NAILS and **Bar Iron** of Superior Finish, made exclusively from Pig Iron.

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Hammer's Adjustable Clamps.

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NEW pattern Heavy Screw Clamps; strongest in the market.

For sale by all the principal Hardware dealers.

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Of superior quality and Hardware Specialties in Malleable Iron made to order.

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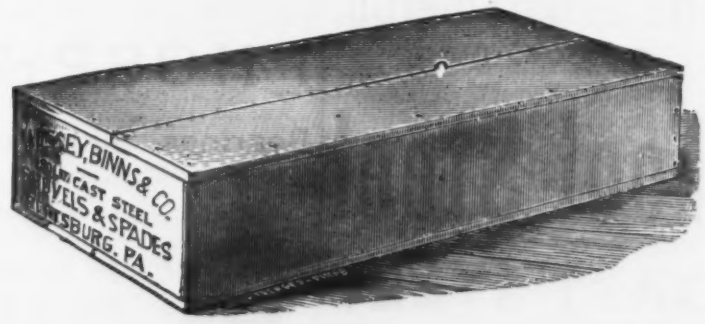
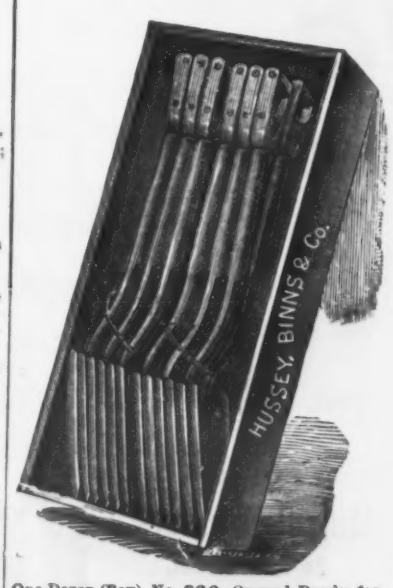
BELLOWS The Best for the Money. Cleveland, Ohio. **FORGES**





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WITH STEEL TOE CALKS.

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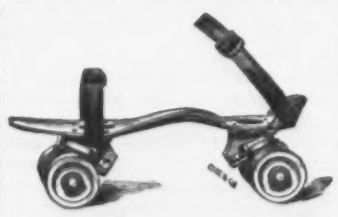

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Sample pair sent on receipt of $2.50.

IRON ROOFING.

Extra quality. Best plan in use. (Sold as low as any other

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Cheap, strong and durable. Does not get out of repair Every roof sold in seven years satisfactory. Any mechanic can apply it. Circular and sample free.

Also manufacturers of the best and cheapest **Metallic Paint** in use.

SCIENTIFIC AND TECHNICAL.

The Friction of Leather Belts on Iron Pulleys.

Prof. Silas W. Holman, of the Boston Institute of Technology, has contributed to the Franklin Institute *Journal* a paper on the friction of leather belts on iron pulleys, which he concludes with the following words:

My own experiments show clearly enough wherein one principal point of divergence between the various carefully devised rules for calculating belting lies. Some of these are based upon coefficients of friction derived from experiments at low rates of slip, some at medium rates, some at high rates, others are based directly on "good practice." If the same belt and pulley had been used by all the observers quoted, each following his own method, the results would have been nearly as discordant as they now are. The question still remains, Which is the best rule to follow? This I am not prepared to answer directly, for there remains an element still to be experimentally determined, viz., the rate of slip which exists in properly running belts on main and counter shafts. That some slip, apart from the known "creep," always exists, can hardly be doubted. It is from measurements of the rate of this slip, which might easily be made by those having large and small belts running under suitable conditions, that further advance in the application of friction experiments to practice must come. The results will probably show that the coefficient to be adopted, depending necessarily on the slip to be allowed, must vary with the kind of work which the belt has to do. Apart from considerations as to the strength of the belt, it will be seen that a loose belt required to transmit an amount of power proportionate to its size would slip upon the pulley at a gradually increasing rate, until such a rate was attained that the coefficient of friction was large enough to maintain the requisite tension difference between the sides of the belt. If the belt were tightened a less difference in tension between the two sides would suffice to transmit the required power; therefore the rate of slip and co efficient of friction brought into action would be smaller than before. If the belt were too loose the slip would become abnormally large, either injuring the belt by excessive wear or throwing it off the pulley. With too tight a belt, on the other hand, the friction and flexure of the shaft become excessive. The size of the proper belt to be used for given work will be determined by these two limitations and that of avoiding an undue width of belt. Since there is for any given belt so wide a variation in coefficient, which may be called into action as the slip changes slightly, it seems that exact computations will never be desirable in estimating the size of belting, and that the study of the laws of friction of belts, at least on iron pulleys, will serve rather to give to the intelligent engineer a scientific guide to the limits within which the work of a belt of given size must be restricted than to give him a fixed factor with which to compute the exact dimensions of a desired belt.

Enameled Glass.

About 15 years ago, says the *Glashuette*, there were seen for the first time in the glass cases of collectors certain remarkable objects of glass which were ornamented with Oriental decorations of the purest and most delicate character, including gold arabesques, &c. These objects, though of modern workmanship, were high in price. They were only to be obtained of the inventor, M. Brocard, and did not appear in the ceramic trade. They were first exhibited by the Union Centrale des Arts Appliqués à l'Industrie in 1869. Specialists and archæologists, however, knew that this was no new invention, but simply an imitation of Damas glass, which at a remote period had been employed in the East for kindred purposes. It doubtless originated from the glass industry near Damascus, and traces of enameled glass have been found under circumstances which point to the employment of that ornamentation in ancient times, but its application to articles of ordinary use seems doubtful. In the treasury of St. Stephen's Cathedral, at Vienna, there is a flask and a vase of remarkable beauty, which afford valuable information on the subject. The flask bears an inscription which has been deciphered by H. Scheffer, and which indicates the eighth century as the date of its manufacture. There may be older specimens extant, but it is certain that this Oriental art is at least to be traced back to that period, and indeed the artistic excellence of both works proves that the art was not exactly in its infancy at the time of their production. At all times considerable value has been placed on specimens of this Oriental work, the two objects in question having been in their present resting place since the fourteenth century. Although Damascus was doubtless the center of this manufacture, Mansourah and Alexandria are known to have produced excellent work at a later period.

The Venetian glass of the thirteenth century bears evidence of a desire to reproduce this Oriental form of decoration; but the imitations were less transparent and the relief work less marked in its character. M. Brocard discovered the process during researches he was compelled to make in order to repair a valuable mosque lamp of genuine Oriental workmanship. It may be remarked that Venetian and Bohemian factories have for a long time used glass colors and gold for decorative purposes, but the productions of M. Brocard display a marked superiority in every respect. Bohemian glass is not really enameled, but is very well painted with glass colors and fired with a weak fire. It is not durable, and is easily injured by chloric acid. The Paris exhibition of 1878 contained some remarkable specimens of this class of work, some of them lent by their Oriental possessors, who had paid as much as $3000 each for them. The prices realized at various art sales for such objects have been materially higher. It is remarked that the foregoing details will show that this description of enameled glass is very different from the *faience* work of Orion known as Henry II style. Oriental work is now in fashion, nothing being so captivating as its forms and ornamentation, which are so ingeniously developed. The introduction of Arabian characters gives the decoration a welcome stamp of originality, and contributes to show us Oriental art in its native purity.

Jacketing Engine Cylinders.

Mr. A. C. Greene, C. E., of Philadelphia, contributes his views on the value of jacketing the working cylinders of steam engines to the Franklin Institute *Journal*. He says:

The steam engine being a machine for the transformation of heat into power, steam acting simply as a vehicle for carrying that power, the entire question, outside of mechanical details, is reduced to a question of heat. As it is axiomatic that a part cannot be equal to or greater than the whole, it is hard to understand how a part of a given quantity of heat can be made to yield more work than the whole of it, or that a given quantity of heat indirectly applied can be more effective than when it is directly applied; and yet this is exactly what is expected of the steam jacket, the jacket being supplied with a certain amount of heat, only a part of which, it is well known, is to be effective within the cylinder or in performing work. It is plain, that, of the heat supplied to the jacket, the loss due to the resistance to transmission through the shell of the cylinder is a loss which does not obtain when the heat is supplied directly to the interior of the cylinder, and that the loss due to radiation from the exterior surfaces, which, though small compared to the total heat supplied to the jacket, must be vastly greater than that from the unjacketed cylinder, from the fact of the great excess of those surfaces and the higher temperature constantly maintained beneath them. Again, the heat from the jacket, which is effective within the cylinder, must act in re-evaporating previously condensed steam, or in superheating, thus increasing the tension, and the steam of increased tension thus produced is subject to losses of the same character within the cylinder as if supplied directly from the main steam-pipe at first, though the limits between which the losses occur may be different with the jacket from what they would be without it. Although the heat is constantly maintained in the whole jacket at all times, it can only be efficient in a part of the cylinder which is on one side of the piston, for on the opposite side it is communicated to the vacuum space, and must be a dead loss for as great a time as it is a gain. Hence the supposed gain attributed to the use of the jacket, it is believed, must be imaginary or due to some other cause.

It has been observed on several occasions, when running engines with the starting valve slightly open to one end of the cylinder to prevent thumping, that, although during half the revolution communication was open directly to the condenser, causing a clear loss, the gain during the other half of the revolution was sufficient to apparently compensate the loss, so that the revolutions were not reduced, nor the coal consumption materially increased; and this in one case with the low-pressure cylinder of a compound engine, the valve being but slightly open and passing steam from the main steam-pipe. A case is also remembered where a steam-engine builder contracted with a mill owner to remodel an old engine and fit it for running his mill, for which he was to receive in payment the price of the coal saved in a certain time by the use of the remodeled engine, compared with that used by the engine of a rival builder running the same length of time. The remodeled engine was carefully supplied with steam jackets and with all the necessary accompaniments, but after a few week's use, and when it came to determining, by careful and accurate management, the quantity of coal consumed on which to base the payment, steam was carefully excluded from the jacket and air admitted instead, simply as a non-conductor to prevent loss of heat by radiation. It is needless to add that steam was not afterwards used in the jacket, and notwithstanding this exclusion the engine continued to work with remarkable economy of fuel.

Whether there is any advantage to be derived from the use of the steam jacket or not, there are several disadvantages with which it is inevitably attended. There is extra material and labor required in the construction, and liability to loss of castings from their extra complicated nature, which cause extra first cost, besides extra weight and space occupied, together with the liability to cracking from unequal heating in getting under way, which are of special importance in the case of marine engines. It is the writer's opinion that the best place to utilize the heat of steam in producing work is within the working cylinder, and not outside of it, preventing as much as possible the losses of heat, not by the use of the jacket, but with light sheet iron to inclose a corresponding space to contain air, which inclosure should be sufficiently tight to prevent circulation of the air and loss of heat from convection, and then carefully and thickly felted, and cased with wood outside of that. With the cylinder properly clothed, it is believed better results would be obtained than by the use of the jacket, and certainly many extra pipes, valves, traps and much annoyance would be avoided.

E. L. Warren, of Worcester, Mass., has patented a wire reel and tub used for holding the wire and the liquid in the ordinary process of drawing. The reel is arranged to revolve horizontally within the upper part of the tub. The tub is made of glazed earthenware, with a thick bottom, having a central opening that receives the lower end of the reel-supporting shaft. This shaft is made of wood and driven tight into the bottom, so that it is held in a firm manner as soon as it is swelled by the liquid. At its upper end the shaft has a spindle which acts as a pivot for the reel to turn upon. The reel is made with a bottom frame that embraces the shaft, and with a top frame carrying a recessed screw that receives the pivot spindle. The two frames are fastened to the ends of connecting rods, while an outer row of rods acts as a guard to hold the coils of wire in position upon the reel. Some of these rods are stationary, while others bear against the coil of wire, and prevent it from turning loosely on the reel.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, August 27, 1885.

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The Panama Canal.

When we last wrote on the management and the future of the Panama Canal, the opinion was expressed that it would take more than the frank criticisms of English and American authorities to break the spell which M. de Lesseps' earlier success had thrown upon French investors. Since then, however, a scathing review has appeared in the leading financial journal, the *Economiste Français*, from the pen of its editor, M. Paul Leroy-Beaulieu, a member of the Institute. Its publication seems to have frightened some of the holders, since quotations dropped seven points on the day of its issue. M. Leroy-Beaulieu considers the enterprise solely from the standpoint of the investor. He urges that, after all, France has little to gain for her commerce from the completion of the canal, when compared with the benefits to be derived by America and England. What glory there might be in it would, he thinks, be dearly purchased. The management is charged with persistent misrepresentations and gross extravagance. Until the last meeting of the shareholders in July the gatherings of those interested were uniformly assured that everything was going well, that the work would be completed within the time and within the estimates first announced. M. de Lesseps put himself on record again and again that the cost would be 600,000,000 francs. A firm of Belgian contractors, Couvreux & Hersent, always called "the great," were given as authority for the estimate of 512,000,000, and one contract was made with them for that sum. Yet when they threw it up they were paid a round sum for abandoning it. Now an equally "celebrated" set of English and Dutch contractors are engaged in the work, and it is naturally asked whether there are any guarantees that they, too, will be ultimately remunerated for failing to live up to their agreement

But it is particularly to the system of financiering that the authority we quote addresses himself. The company have issued 600,000 shares of a par value of 500 francs, bearing 5 per cent. interest, on which one-half only has been called; 250,000 5 per cent. 500-franc bonds, 600,000 3 per cent. 500-franc bonds and 387,387 4 per cent. 500-franc bonds. These securities were quoted on the 13th inst. 355, 222.50 and 290 respectively, and at the rate at which they were sold by the company cost from 7 to 8 per cent. interest. Instead of calling in the balance of the share capital the company have blindly followed the principle of issuing new obligations, and it is insinuated that they have wasted much money in bulling the older issues just before trying to float a new one. Now the admission is finally made that they must place on the market an additional issue of 600,000,000 francs, which is to be made tempting to investors by asking the Government to allow it to be coupled with a lottery, which, it is just to add, is not an unusual proceeding. Thus the cost of the enterprise is nearly double that of the original estimate, and its fixed charges are run up through the system of issuing bonds at a heavy discount, making the holders of this class of securities bear the weight of the enterprise, while one-half of the share capital, which would bear only 5 per cent., still remains subject to call

M. Leroy-Beaulieu charges the Panama management with deliberately misrepresenting the conditions affecting the prospective future revenue. He holds that it cannot hope in this century or the first half of the next to have gross receipts equal to that of the Suez Canal now, which are 64,000,000 francs. He analyzes the trade which lies within the "zone of attraction" of the Panama Canal, the most important being the California trade, and comes to the conclusion that, while the Suez Canal has 6,000,000 tons net tonnage, the Panama Canal can only possibly, at the outstart, reach 5,000,000 tons of merchandise, but would probably control much less. The management estimates on 15 francs as the toll, which in some cases is more than the entire freight paid now, and in all instances is an absurdly high figure. M. Leroy-Beaulieu finally reaches the conclusion that it is not likely that the gross earnings of the canal will be more than 40,000,000 francs at the outstart, while if the present extravagant system continues the fixed charges will foot up to 130,000,000 or 140,000,000. Putting aside all technical questions—and they are serious enough—it looks as though the Panama Company will have to go through a period of liquidation before they can reach a sound basis. Those who have risked their funds will be forced to pay for a part of the extravagance, but it seems certain, too, that a part of it will have to be borne by commerce, and that prospect is one which the American business community must view with some dissatisfaction.

There is one curious point in M. Leroy-Beaulieu's review which should not be allowed to pass without comment. Sharply critical though he may be of everything connected with the enterprise, he seems prompt to accept without question one item, 1,500,000 francs annually, specified as the "American Committee." This, he says, "appears "to be the bribery fund of the company, intended without doubt to enlighten the press "and the statesmen of America by material "arguments." Insinuations of this character, directly leveled at men and newspapers in this country, have gone the rounds abroad. Would it not be much more seemly that, in a concern so strongly under the shadow of doubt, a thorough investigation at home should be instituted before casting unworthy suspicions elsewhere? If the French press had cared to be as well informed as the press of this country, and had spoken as fearlessly, the unfortunate Panama company would not be so far on their way to ruin.

Tariff Revision.

The members of the Administration and the leaders of both political parties in Congress have evidently fully acquiesced in a reopening of the tariff question as a matter of economic necessity as well as of party policy. The possibility of such a movement, hinted at by the Secretary of the Treasury early in the new Administration, has recently been supplemented by a circular of inquiry for information from manufacturers and others for the purpose of putting a stop to alleged undervaluation of imports, which it is charged has grown to such an extent as to seriously impair the revenues, by the substitution of specific for ad valorem duties. The Secretary does not concede that the information which he expects to gather in response to his circular is for any other purpose than transmission to Congress. At the same time, however, he has directed Assistant Secretary Fairchild to give the subject his attention, and that official in turn has assigned several agents of the department to the duty of collating the data on the line of the general proposition set forth in the inquiry. The scope of such a work, and the recommendation of specific for ad valorem duties, would seem to involve a very comprehensive treatment of the tariff schedules, and could hardly end short of a complete tariff bill, the very thing which the Secretary now disclaims. In connection with the promulgation of the circular it may be said that there appear to be indications of a decided disinclination on the part of the various industries addressed to furnish the desired data without some previous assurance or guarantee that it is to be applied to some well-defined scheme of tariff revision favorable to American industry. A simple collection of information to be unloaded upon Congress somewhat after the manner of the voluminous, undigested and practically valueless "testimony" of the old Tariff Commission, will not be likely to meet with any more favor among manufacturers than among Senators and Representatives. Should the Secretary, however, following the precedent of one of his distinguished predecessors, formulate a tariff bill and transmit it to Congress with an indorsement from the President, the question would then be presented in a tangible form, would undoubtedly receive attention and might constitute the groundwork of ultimate legislation. The fundamental proposition as to the nature of revision and the processes by which it might be best attained would then be presented, subject to adaptation, as far as practicable, to the diversity of interests and opinions by the representatives of the people of all sections in Congress. There is every evidence that the movement to revise and readjust the tariff, which is now proposed and acquiesced in by all parties, will lead to the most comprehensive and earnest consideration of that great economic question which has been known in the history of tariff legislation. The most favorable sign is the fact that there exists an almost universal desire on the part of all concerned to undertake the task in a spirit which will reconcile conflicting interests.

Our Trade with Hayti.

Since the collapse of the Haytian rebellion with the fall of Miragoane, on January 10, 1884, the Republic has been getting on tolerably well. Although the wounds inflicted by the protracted and sanguinary struggle were deep, and the financial resources of the Government were crippled while quelling the revolution, the revival of confidence and the recovery from prostration has been rapid. General Salomon's policy has been conciliatory at home, and cautious with foreign nations, several of which had claims against the Government arising out of the late civil strife, and from other causes. There was a difficulty pending with our Government about the imprisonment for debt, on March 6, 1884, of Mr. C. A. Van Bokkelen, an American citizen, at Port-au-Prince, and up to May last his release was refused, but, on ascertaining that the new American minister was coming out in June, Mr. Van Bokkelen was set free. In June, the American-Haytian Claims Commission at Washington closed its labors, and on the 20th of that month filed the final awards in the two cases of Pelletier and Lazere, the heirs of the former to be paid $57,250, and the latter $107,500, by Hayti. In July the Haytian Government paid the French minister at Port-au-Prince 242,267 francs on account of interest due since April 12, 1880, on the consolidated French loan of 1875. Poor as Hayti is, she seems ready to meet liabilities as the country recovers. Another difficulty about illegally arresting some Frenchmen and Englishmen, and still holding them, has caused men-of-war of both nations to proceed to Port-au-Prince, but a prompt release is expected in this case likewise.

The entire foreign and home indebtedness of Hayti does not exceed $12,507,884. The annual expenses of the Government are a little over $6,000,000, about squared by the income, and capable of leaving a surplus in years of prosperity. The frontier dispute with the neighboring Republic of St. Domingo is still pending. There is an apprehension in the latter that Hayti may use this difference as a pretext for invading the weaker country and attempting to reconquer it, but in March last the Haytian minister accredited to the Dominican Government, M. Felix Richiez, declared emphatically that President Salomon was never more amicably disposed toward his neighbor than at present. Since pacification American trade with Hayti has revived vigorously, so much so that both our domestic export and our import show a notable increase:

AMERICAN TRADE WITH HAYTI.

Calendar year.	Domestic export.	Import.
1884.....	$3,346,645	$2,627,713
1883.....	2,818,373	2,390,482
Increase.....	$528,272	$237,231

Our chief import article from Hayti is coffee. The ensuing figures show the growth of the trade and the rapid increase of coffee importation for the year ending June 30 of the following years:

Coffee Import.

	Pounds.		Pounds.
1869.....	3,114,151	1877.....	12,269,344
1870.....	2,437,355	1878.....	12,813,113
1871.....	3,283,353	1879.....	16,660,030
1872.....	3,874,781	1880.....	22,659,285
1873.....	6,187,560	1881.....	31,908,074
1874.....	4,752,330	1882.....	22,527,950
1875.....	9,545,410	1883.....	17,944,600
1876.....	11,837,508		

It will be seen that, from being an insignificant trade 16 years since, it has become one of respectable proportions latterly. Prosperity in Hayti hinges chiefly on the coffee crop, its size and the price obtained. There being a good sale for it in this country, it has been more freely imported here for some five years past, and in the course of time we may receive nearly the whole of it, as Europe discriminates too much against its quality. This being the tendency, the Haytians resort to the United States for their supplies more than formerly, and, moderate in volume as it is, this trade is understood to pay those engaged in it better than any other with the West Indies. The whole trade from this coast has for 30 years past been carried on by a few rich houses well represented down there, so that they run, comparatively speaking, but little risk during times of revolution, which are chronically frequent; but the profits are large. Latterly coffee prices have been very low, but since pacification the yield has been abundant. During the year which preceded the late revolution Hayti exported 51,702,927 pounds of coffee, 264,012,050 pounds of logwood, 3,382,192 pounds of cocoa and 1,790,832 pounds of cotton.

Steam communication with the outer world is kept up by six lines of first-class steamers, one of which runs to New York. The maritime movement as last given shows entries during a twelvemonth of 1177 seagoing vessels, of which 385 were steamers, the total tonnage entered being 1,280,171. Haytians indulge very little in luxuries, so that European trade has less hold upon them than it has elsewhere in countries south of us. They consume a considerable amount of American staple products. Thus, during the year ended June 30, 1884, they took 72,882 barrels of American flour, 4,668,420 yards of cotton goods, 7,506,640 pounds of codfish and mackerel, 7,850,657 pounds of provisions, and a large amount of lumber and other goods. It is in every respect a desirable trade, and, as we have explained, even in times of revolution our merchants have so guarded themselves that they are not much exposed to losses, which is more than can be said of our commercial relations with the bulk of Spanish America. Nor is American capital exposed to being jeopardized in Hayti, for the simple reason that there is none invested down there. Hayti is the only civilized country—or, rather, the only country having a semblance of civilization—which does not indulge in railways and telegraphs, and has therefore had no occasion to appeal to foreign capital for either, and perhaps never will, which, for the outside world, is one danger less of being entrapped in bad investments.

German Colonization.

An example of the lengths to which the German authorities are willing to go in their colonizing craze is furnished by the report of a prominent official, Herr W. Spielberg, who made a journey to Canada and the Northwest in 1883, and to the Argentine Republic and Southern Brazil in 1884, in behalf of his Government. This gentleman has evidently understood his mission, though he has indiscreetly allowed his instructions to become apparent in the principles which he coolly lays down. After making the astonishing announcement that in Canada the long, severe winter, late spring and early fall frosts make the cultivation of wheat, oats and peas uncertain, and that the cold prohibits cattle-raising on a large scale, he asserts that, on the whole, the same conditions prevail in Montana, Dakota and Minnesota. He kindly concedes in their behalf that the winters are shorter and the average temperature is higher, but urges that on some days the temperature is even lower on account of the altitude and the northwest storms. Then he goes on literally, speaking of the Northwest:

> The political and social conditions do not offer the settler that independence and freedom of movement which he will find in Canada, and Germans will not feel content, or they will be overreached when they come into contact with the Yankees or the Irish immigrants. However great or however small may be the personal success which these countries offer to the immigrant, the trouble remains that the body of the German immigrants is absorbed by the new nation forever, and is permanently alienated from its home; that a part, either by breaking virgin soil or improving the cultivation, helps to bring about a decline in the agricultural products raised in Germany, and that a part facilitates the competition of American industries with our own by supplying labor to it.
> * * * From all this I conclude that German immigrants are to be weaned away from North America. Since the stoppage of emigration to that quarter is out of the question, the point is to gradually divert it to other districts from which no competition in agricultural and industrial pursuits is to be feared in the future, provided the same prospect of success is held out to the emigrant.

Herr Spielberg went on a voyage of discovery to find that promised land. The Argentine Republic proved a failure, one of the reasons being "the violent nature of the "Spanish race, which is more hostile to the "foreign element than, for instance, in the "United States, the lack of consideration and "the egotism of the Yankees, who, it cannot "be denied, do have a certain respect for "law." The Province of Buenos Ayres would not do, because German colonists would raise large quantities of wheat for export. Southern Brazil, however, filled the condition of doing no harm and of holding out the prospect of doing a little good. One small obstacle is promptly removed. Many years since, large numbers of Germans emigrated to that very part of the world, and the colony proved all but a dead failure. It is claimed now that these people went too far from the coast. The conclusion, therefore, is "divert the absolutely injurious emigra- "tion to North America into a relatively use- "ful channel—to Southern Brazil."

From the standpoint of the German Government this may be a good policy, and the people of the United States will have no reason to object to it, provided no unfair means are taken to advance it. Unfortunately for the powers that be in the Fatherland, and for its sons who seek a future outside of the reach of its bayonets, this is not the case. The people and the conditions affecting the prosperity of emigrants to this country have been and are still persistently and grossly misrepresented, the instance quoted being only a mild form of this scandalous system.

The statistics for the first half of the year 1885, just published by Mr. J. S. Jeans, secretary of the British Iron Trade Association, show a condition of affairs very similar to those revealed by the publication of like data in this country. In pig iron the decrease from 3,991,220 tons during the first half of 1884 to 3,807,095 tons in the first half of the current year amounts to 184,125 tons, and, in the face of this decline in the make, the stocks held by makers and in warrant stores have grown from 1,425,343 tons on June 30, 1884, to 1,668,729 tons on June 30, 1885. In steel ingots we witness a decline in the production in the half-year from 647,843 to 623,772 tons, a trifling falling off, therefore, but the make of rails has dropped from 426,415 tons to 333,697 tons, or 92,718 tons less. This means, therefore, that the growth in the use of steel ingots for other purposes than rails has nearly filled the gap caused by the falling off in the demand for rails. It indicates a gain of, very roughly, 90,000 tons in the employment of Bessemer steel for structural uses during the first half of 1885 as compared with the corresponding period in 1884, allowance being made for the waste in converting ingots into rails. When it is considered that this was accomplished in the face of a general depression in the trades consuming iron, and notably in shipbuilding, the apparently small figure becomes an ominously suggestive one to English iron rolling mills.

The Workingmen's Demand for an Extra Session of Congress.

A movement looking to the calling of a special session of Congress for the purpose of considering measures for the relief of the industrial classes of the country and the revival of business has been started by certain labor leaders in Western Pennsylvania. Mr. Thos. A. Armstrong, a prominent Greenback-Labor leader of Pennsylvania, seems to have charge of the memorial asking the President to call the extra session. This memorial, of which copies are being sent to every labor organization and grange through the country, is as follows:

To His Excellency, the President of the United States:

The undersigned citizens of the United States respectfully represent that the country is suffering under general stagnation of business, which involves all of the useful classes in great loss and suffering. The consequences of this depression are especially severe upon the laboring people, small manufacturers and farmers, who are without any reserve means upon which to live or to pay their debts, and to save their homes and small properties from forced sales. Employer and employed are involved in common disaster.

We believe that it is in the power of Congress and the Executive to greatly alleviate, if not absolutely relieve, this depression by wise legislation. We therefore request you to call an extra session of Congress, to be devoted exclusively to the consideration of measures for the relief of the industrial classes of the country and the revival of business, said session to convene on or before the last Monday in September next. And for this we pray.

This is practically an invitation to the President to call Congress together for the purpose of forming itself into a committee on the depression of business and finding the remedies therefor. We have no idea that the President will grant the petition of these gentlemen, but, should he do so, we have just as little hope that any good would result from the movement. It is possible that the facts in regard to the depression might be made more evident, though that is scarcely necessary, as the condition of things is altogether too apparent. A cure is needed, no doubt, but that Congress can effect the cure we greatly doubt. If an agreement could be reached as to the source of the evils, we imagine that a remedy would not be difficult to find, but, when there is such a wide diversity of views as to the cause, it is not at all remarkable that there are innumerable suggestions as to the cure.

We presume that those having this memorial in charge think the cure is to be found in expansion of the volume of the currency, the old greenback craze; but others just as honest and probably as capable believe that an expansion in the currency of the country at the present time, instead of curing the present evils, would entail others even more hurtful than those that now exist. It is one of the misfortunes of labor that its leaders commit it to so many impracticable schemes—schemes that do not in the least commend themselves even to the judgment of vast numbers of the workingmen themselves—so that the demands of labor do not receive that attention either from the public or from legislators to which they would be entitled were they less visionary. The country at large is not so charmed with Congress when it is in session as to desire or earnestly long for its re-appearing, and except in times of great peril, or when it is evident beyond a question that its meetings and action will avert some great calamity or cure some pressing evil, the country at large will not desire to see extra sessions. We believe that the total injury to the business interests of the country from an extra session of Congress at the present time would far outweigh any possible advantage that might accrue from it.

The statement in our issue of last week relative to the percentage of phosphorus in the Isabella pig iron now being converted in the Clapp-Griffiths plant of Oliver Bros. & Phillips was rendered widely erroneous by the accidental omission of a decimal point. Instead of 3 per cent. phosphorus it should have been .3 per cent. The mistake was one which would be readily observed by the reader, and not at all likely to mislead those for whom the subject had interest.

The Exhaustion of Fuel Supplies.

A great deal has been written in late years regarding the near exhaustion of the coal fields of great manufacturing nations, and especially of those adjacent to great manufacturing centers. Royal commissions have been appointed to consider the imminence of such exhaustion, and some of the best known of English economists have investigated the subject most carefully and thoroughly. We believe many of their conclusions are erroneous, and the fears expressed without the least foundation. We have no doubt that should the consumption of coal in many sections continue increasing in the same or nearly the same ratio as it has for the last ten years, and no new fuels be discovered or more economical methods of utilizing coal be found, the arithmetical deductions of these gentlemen would be true; but the probabilities are, and this view is pointed out by experience, that with the increasing demand for fuel more economical methods of consuming coal will be introduced and other fuels will be found. Every metallurgist knows the wonderful fuel economies that have been gained by the introduction of gas into metallurgical operations. In Pittsburgh, some years ago, 3 tons of selected coke were necessary to make a ton of crucible steel. This coke required for its manufacture, say, 4½ tons of coal. Now the same amount of steel is melted with from 15 to 20 bushels of slack, a saving of, say, 80 per cent.

Natural gas will readily suggest itself as one of the new fuels. Pittsburgh manufacturers are settling down to the belief that, while it is possible the wells from which the present supplies of this wonderful fuel are produced may be exhausted in time, the territory in which it can be found is extensive enough to supply their factories for years to come; and while each year the supply-pipes may be run further and further from the points of consumption, there is no immediate danger of an exhaustion of the supply. Petroleum also seems to be rapidly coming into favor as a fuel—not so rapidly in this country, however, as in others. Late information is to the effect that the Russian Admiralty have ordered that 12 gunboats shall be immediately provided with furnaces for burning mineral oil instead of coal. The substitution of petroleum for coal for steamships is progressing rapidly in that Empire. Already there are upward of 300 steamers burning this liquid fuel, and their number is being added to almost daily. This is a matter that must even now affect the coal trade in an appreciable degree. It is reported that the owners of an important line of steamers to Australia are likely to adopt oil furnaces shortly. The space occupied by the oil for a given effect is scarcely more than half that required for coal, an advantage of great importance in long voyages. The oil can be taken in, too, in much less time than coal. A fuel famine would seem to be far in the future, and those who predict its near approach are causing needless alarm.

Small Bessemer Plants.

The rage for "baby" Bessemer plants seems to be spreading abroad. In our country 4-ton converters are, even for the Clapp-Griffiths process, considered the most suitable in size. These 1-ton and 2-ton vessels are finding favor. An interesting piece of work is going on at the Stenay and Traisans works, where Clapp-Griffiths plants have been running successfully on Bessemer pig for more than eight months, producing an excellent metal at figures which, it is said, rival those of the ordinary acid process. At the same time, the Stenay Works have put in a Walrand-Delattre plant, treating also a higher class of pig. This plant has been duplicated at the Hollerich Works, where it is being used for the purpose to which it is best adapted, the treatment of phosphoric pig. The Walrand and Delattre process has great similarity with that of Harmet, tried years since at Creusot. It consists in blowing till the elimination of carbon and silicon in an ordinary acid-lined converter, and performing the after-blow for the removal of phosphorus in a second vessel, lined in this case with magnesia. An engineer who witnessed a blow at Hollerich states that the work on the first converter took 13 minutes, and that it required only 4 minutes to eliminate the phosphorus in the second vessel, which, by the way, was charged with 7 per cent. of lime The charge was only 1.5 tons, but the heat was ample, and the waste 18 to 19 per cent., or about as much as the basic process under ordinary conditions would show. It is reported that continued working with these two vessels dispelled the doubts generally held as to the practicability of the system, and the metal itself proved to be of excellent quality. On the latter point metallurgists will have little doubt, since the records of working with the basic process have proven the matter. While on the one hand the extra handling of the steel seems to involve mechanical difficulties of no mean order, the matter comes down finally to the question whether the money value of the improvement in the quality through the elimination of phosphorus counterbalances the extra cost of an after-blow in an extra vessel, the wear and tear of which cannot be great.

Since India has become one of the formidable competitors of our Western farmers all points relating to the growth or the means of utilizing its resources and marketing its products deserve close watching. The Indian Government has made strenuous efforts to develop the railroad mileage of the country, with what results may be gathered from the following figures extracted from a report by Col. F. S. Stanton, the director general of Indian railways:

	1884.	1883.	1882.
Mean mileage open for traffic.	11,114	10,408	9,985
Number of passengers carried.	73,815,119	65,098,953	58,875,918
Number of tons of goods moved.	16,663,007	16,999,264	14,883,243
Number of tons of general merchandise	10,750,809	10,983,265	9,275,065
Gross receipts	£12,647,920	£12,898,130	£12,058,080
Working expenses	6,382,920	6,236,900	6,001,260
Net receipts	6,264,990	6,651,230	6,056,810

This, of course, is by no means a brilliant showing, and the railroad mileage of the country is very small when compared to the area of that magnificent Empire. Besides its own State lines the Government has followed the practice of guaranteeing interest on private enterprises. In this way it has advanced from the commencement of operations a gross sum of £64,393,736, of which £38,444,123 has been repaid, leaving £25,949,613 as the sum still to be refunded.

Coal Tribulations.

The anthracite coal trade, as seen from the producer's position, is in a deplorable plight. In a word, the trade is congested under excessive production. Leading coal companies in the so-called combination are so much involved in Wall street that it seems impossible for them to discover where their true interests lie and what considerations should guide their action. Under such circumstances it is not strange that some of the parties to the coal allotment arranged last spring are becoming factious and evince a disposition to kick over the traces, even if the coal wagon goes all to pieces. Trouble came at the very outset, when the Pennsylvania Railway Company, which have large bituminous interests, refused to enter into any agreement with the anthracite carriers, and proclaimed an independent policy. Moreover, bituminous coal continued to encroach on the market at the lowest prices. Finally the Delaware, Lackawanna and Western Railroad Company, of which Mr. Samuel Sloan is president, became restive, and of late persists in producing the full allotment, regardless of remonstrances from any quarter. At the same time the Delaware and Hudson Company reduce their schedule price from 10 cents to 15 cents per ton, and the Pennsylvania Coal Company also take a hand, meeting cut rates with a corresponding reduction. It is but fair to explain, however, that the seeming "cuts" do not necessarily mean war, being entirely nominal—in fact, simply an approaching to prices which have been actually current for some time past.

The trade is obviously demoralized and disconcerted, if not naturally at variance within itself, as a consequence of intricate problems with which it had to grapple. Perhaps the paramount question just now relates to the September allotment, which is the same as that for August, viz., 3,250,000 tons. A meeting arranged to take place at Saratoga on the 26th inst. was ostensibly designed for the consideration of Western business, but it was surmised that other subjects might casually be presented—to what purpose, in case Mr. Sloan failed to attend, was not at once apparent. It would be disingenuous to assume that consumers of coal, especially those who are struggling with the problem of cheap iron, are in the least distressed by the plight of the coal producers.

In a letter to the London *Economist*, Mr. William J. Harris, M. P., draws a very gloomy picture of the condition of the farmers in Great Britain, and he bases, upon a series of figures which have not yet been challenged, a pretty sharp thrust at the manufacturing industries. He aims to show that in England the agricultural classes are bearing far more than they should of the burden of taxation, although "free trade has "put our farmers in direct competition with "the owners of foreign virgin soil." Mr. Harris estimates that the total valuation of the saleable produce of the soil of England and Wales is £112,511,490. On this the farmers pay in taxation of one kind and another £16,013,000. The labor bill amounts to £34,700,000, so that, deducting rents and tradesmen's bills, "the amount left for the tenant farmer is nothing." Mr. Harris concludes that the cultivation of all the less fertile arable lands must necessarily be abandoned.

The State Department is receiving numerous responses of consuls to the circulars recently sent out calling for information relating to various industries abroad in which American importers, merchents or manufacturers are interested. In reference to the shoe and leather business, Consul Harper, at Munich, says many factories are completely furnished and conducted on the American plan. At Liverpool and Leith, it is remarked that, with some improvement in the preparation of American goods, the leather trade might be largely extended.

The American firm of Grace Brothers & Co. have a claim against the Chilean Government of $1,000,000, growing out of damage to their property in Peru. Other American firms have claims which have been lodged in the State Department at Washington.

The Administration and the Tariff.

In the issue of *The Iron Age* of March 26, 1885, was published an authorized presentation of the position of the Administration on the tariff, by the Secretary of the Treasury, in an interview with our regular correspondent at the National Capital. The continued requests for copies of that interview, the exhaustion of the edition containing the original publication, and a desire to accommodate further demands, has led to the reprint of the full text below:

The correspondent of *The Iron Age* opening the subject, the Secretary of the Treasury replied: "I fully comprehend and appreciate the fact that there is a great and proper desire on the part of the people and their enormous and growing mechanical interests throughout the entire country to know something of the probable policy of the Administration on the tariff and cognate questions. You will agree with me that it is a little early as yet to advance any very specific views on the subject. The time of the President and members of the Cabinet has been too much taken up in getting the machinery of the Administration started, but generally, I may say this for the present, that when the tariff question is reached as a measure of administrative policy the President will carry out the tariff plank of the Democratic platform both in spirit and letter. In this I believe he will be supported by the entire Cabinet."

Correspondent: "Several members of the Cabinet, Secretaries Bayard and Lamar and Attorney-General Garland have been rather free in their views on the tariff."

The Secretary: "I cannot say as to that; they may have their views. All I can say is that whatever position the Administration may take it will be in the line of the Democratic platform, and I anticipate harmonious action in that direction."

Correspondent: "The President has thus far on other subjects adhered very closely to the principles of the platform upon which he was elected."

The Secretary: "He has, and the people will find as his plans develop that he takes a conscientious view of the obligations of his position as they are presented in the platform upon which he was elected. He is not disturbed by temporary clamor or antagonisms. Opposition must be expected. The President simply wishes to be convinced that he is right, and then will go ahead. On the tariff question, you may rely upon it, he will follow on the line of the platform upon which he was elected. In doing that I am confident that the people having the best interests of the country at heart will sustain him."

Correspondent: "In his letter of acceptance he refers to labor, but not to the tariff."

The Secretary: "True, but he mentions very specifically that he indorses the platform in every particular."

Correspondent: "The Democratic platform is somewhat comprehensive on the tariff, but is differently construed."

The Secretary: "You may take the tariff expressions of the platform as the groundwork of the policy of the Administration when the tariff question is reached for consideration."

Correspondent: "I presume the tariff question will be reopened?"

The Secretary: "I think it will be. The Democratic party in its platform is pledged to a revision of the tariff. It adds, 'in the spirit of fairness to all interests.' The faith of the nation must be preserved inviolate. Therefore whatever is done on the tariff by way of revision should be done cautiously and by conservative methods. In reducing taxes we must not ignore the interests of domestic industries. The customs being the chief source of revenue must be relied on for that purpose, and any radical measure might seriously cripple the financial condition of the Government."

Correspondent: "Some industries rely upon absolute protective legislation."

The Secretary: "That is true, and therefore whatever changes should be made in the tariff laws, the interests of labor and capital alike must be considered."

Correspondent: "Great stress is laid on limiting taxation to the requirements of the Government economically administered."

The Secretary: "That is the doctrine of the platform, but then in an explanatory clause it says that the reduction must be made without depriving American labor of the ability to compete with foreign labor, and without imposing lower rates of duty than would be sufficiant to cover the additional cost of production due to higher wages here.";

Correspondent: "That would impose but few changes in existing statutes."

The Secretary: "I cannot say to what extent, as I have not yet examined the subject. Going back to the platform, it might be that duties would be levied on fewer imported articles, the heaviest being on articles of luxury, and lightest on articles of necessity, but this must be done with reference to our home industries, home interests, home labor and home capital. The tariff is a difficult subject to adjust when you undertake to reconcile all interests. It resolves itself into a simple question of the greatest good to the greatest number."

Correspondent: "I have heard a hint that the Administration might formulate a measure of its own and submit it in the report of the Secretary of the Treasury to Congress."

The Secretary; "I cannot say as to that. Circumstances will determine what course to pursue. The tariff is properly a measure of legislation, but the Secretary, no doubt, has the right to recommend. There is an instance in the history of the department where such a course was pursued. I believe it worked very well. The tariff question will be considered, at the proper time, and the plan of procedure will then be arranged."

A cable dispatch from the City of Mexico, via Galveston, announces that the Vera Cruz Railway has reduced the freight rate from $54.32 to $40 on a number of articles imported from the United States, including agricultural and other machinery, oil in barrels, &c. The rate on cotton and oil by the carload will hereafter be $30 per ton. The change has been made avowedly for the purpose of successfully competing with the American railways. The Central road, having a through line from the United States, has been able to land goods there in competition with the Vera Cruz line and its New York connection—the Alexandre line of steamships. The reduction made by the Vera Cruz line is the first decided move against American railway competition, and the mercantile community regards the change with satisfaction, hoping that a sharp competition will bring about still further reductions. The new freight tariff goes into effect on Monday next. The leading articles on which the freight has been fixed at $40 per ton are: Oil in barrels, tar, steel plows, iron, copper and steel wire, sulphur, hoes, oats, starch, pumps, leather and rubber belting, electric batteries, boilers, chains of iron, iron, copper, zinc and lead tubing, iron safes, iron pillars, cement, beer, staves for barrels, axles-stearine, iron in pigs, bars and beams, sheet tin, steam engines, unwrought metals, lithographic-stone copying presses, slate for roofing, kerosene, millstones, printing type, wine, vinegar, candles, anvils and machinery of all sorts.

The Manufacture of Cast-Iron Pipe in Pittsburgh.

To the Editor of the Iron Age.—DEAR SIR: We notice in *The Iron Age* of the 13th that a large portion of the introduction to your Pittsburgh letter is devoted to the question of cast-iron pipe works in Pittsburgh. You say in it with justice that Wm. Smith & Co. and James Marshall & Co. both had large and extensive foundries there, and that they finally went out of business. Marshall's failure, of course, cannot be attributed to the cast-iron pipes, his foundry being a successful one. This was on account of its being of a size such as the demands of that section warranted. Mr. Smith's foundry was built with the intention of supplying the far Western trade. He was prevented from getting profitable prices, except at home, by the foundries being erected at Cleveland, Columbus and Cincinnati, and it is the fact of these foundries being situated west of them, and ourselves with the other Eastern foundries east of them, that reduced the volume of his business to such an extent that he was not able to secure the tonnage sufficient to compete.

We fear this will be the history of all cast-iron pipe foundries in Pittsburgh, viz.: that their immediate territory is too small to permit of a foundry being built of sufficient capacity to compete cheaply with the other larger foundries, and not go outside of its immediate district for its customers, and this will become aggravated to a greater extent as low freights predominate and the larger foundries can more readily penetrate its immediate neighborhood.

We wrote this simply that you may understand the reason that Pittsburgh does not have cast-iron pipe foundries, and, to epitomize it, it is this, that it takes a large amount of territory to afford a sufficient tonnage to run a shop. It is all the more clearly demonstrated when it is considered that the leading shops are all at points where they can command an uninterrupted and extensive distribution. Yours very truly,

R. D. WOOD & Co.

PHILADELPHIA, PA., August 14, 1885.

Mr. Wood's reasoning does not, we believe, invalidate the claim made by our Pittsburgh correspondent, that that locality should be a more important center than it is in this industry. If pipe works can succeed at Cleveland and at Columbus, it is difficult to understand why they should not do so at Pittsburgh, since, other things being equal, the latter city could reach a large portion of the territory to which not alone they, but also Eastern cities, deliver pipe. It is urged that, for instance, certain parts of the South are as near to Pittsburgh as they are to Philadelphia. It is claimed that Pittsburgh should be able to put pipe into Altoona, or even as far east as Hollidaysburg, as cheaply as Philadelphia foundries, and that its chances at Buffalo should be as good. It was charged at one time that Eastern foundries could send pipe right through Pittsburgh to Chicago for only 5 cents a hundred more than Pittsburgh shippers could do it, although the haul is nearly double.

Who Will Control the Bessemer Steel Trade of the Future?

To the Editor of The Iron Age.—SIR: Before the close of the year 1886 there will be 10 or 12 more Bessemer converters ready to go into operation, with capacities ranging from 4 to 8 tons. The product of these, in addition to the make of the works already in operation, will be so large that it may become a drug on the market unless the field of its usefulness is largely extended. Doubtless every manufacturer who has engaged or expects to engage in the manufacture of Bessemer steel will say that he only wants his share of the trade, which, to say the least, is not surprising, but I am afraid circumstances point to the conclusion that a great many will be disappointed. Every manufacturer who has had any experience whatever knows that, as the number engaged in a certain business increases, unless there be a proportionate increase in the demand, so does competition grow; and he also knows that he must produce a better article at a much lower figure than he did when he alone controlled the market. When I speak of selling at a lower figure I do not wish the reader to infer that I think the firm that can sell at the lowest price, regardless of the quality, will be successful, for quite often the cheapest article in the beginning proves to be the dearest in the end. This is particularly true of Bessemer steel. It can be cheaply made, but the manufacturer that experiments much in this direction at the present time, regardless of quality, can number his days of prosperity. Is there any intelligent manufacturer who would for a moment suppose that he can dispose of an inferior article simply because he offers it at a lower price than the manufacturer who produces a good and reliable article? This may be done in some cases—for instance, when the product is for the manufacture of nails, where only a certain degree of malleability is required, regardless of its other qualities; but just let this same manufacturer produce steel of like quality and roll it into blooms for other and more important purposes, such as boiler plate, bridge blooms, ship plates, locomotive axles, &c., and see how quickly he will realize that the Bessemer steel of the future must not only be sold at a reasonable price, but must also be of the very best quality in every sense of the word.

I am willing to admit that the very best materials can be used in the manufacture of Bessemer steel without obtaining as good results as are expected, but this is undoubtedly the result of employing inefficient managers and workmen, a course that, if pursued for any length of time, will certainly prove disastrous to the firm that adopts it. This is particularly true in regard to the manufacture of Besssmer steel at the present time. For instance, suppose a consumer of iron concludes to discard iron in favor of Bessemer steel—at least to give it a fair trial; he naturally orders a small lot in order to test its merits compared with iron. The test in all probability will be a severe one. Now it is quite evident that if this lot does not meet his requirements he will naturally conclude that either Bessemer steel is not what it is said to be, or that the manufacturer who furnished the trial lot in question did not thoroughly understand its manufacture. Therefore, manufacturers about to embark in the manufacture of Bessemer steel, who wish to be successful, will have to erect the most improved plant, adopt the latest and most approved methods of manufacture, as well as employ the most intelligent, scientific and practical manager that can be found. They dare not leave a stone unturned that will lead to the production of steel of the very best quality. Doubtless many will say that such a course will prove to be a very costly one, but, nevertheless, I am satisfied that it will in the end be by far the least expensive. It is just at the present time, when the reliability of Bessemer steel is to many just a little doubtful, that these few facts particularly apply. There is plenty of room for the manufacturer who embarks in the Bessemer steel business with the intention of producing steel to suit the requirements of the times. But to meet with any degree of success he must, I say, erect a good plant, have it well equipped, and employ the best managers and workmen. He must give his manager good material, full charge and a fair salary, and there need be no fears entertained as to the success and prosperity of the new enterprise, for he is one of the manufacturers who will control the Bessemer steel trade of the future. S. MCDONALD.

BENWOOD, W. VA., August 22, 1885.

The Window-Glass Trade.

The following is a synopsis of the report of Mr. F. L. Bodine, president of the American Window Glass Manufacturers' Association, presented at the recent annual meeting. Regarding the state of trade Mr. Bodine draws the following gloomy picture:

"Large consumption offset by still larger production; large imports by largely augmented stocks; large capacity for the coming year beyond any probable consumption; large decline in selling price and continued high wages cost all point to losses accrued the past year and large losses to come, if no change be made. The value of stocks on hand is at least 30 per cent. less than that prevailing last July (1884), making a loss on total stocks in manufacturers' hands of over $600,000 to be added to what has been lost on glass manufactured and sold."

The report shows that in the blast of 1884–85, 116 furnaces and 1027 pots were run. The average length of the blast has been 36 weeks, making a reduction of 15 per cent. in time and product. The product for the blast was 2,900,000 one-half boxes. The stock on July 1 was 693, 841 boxes, as compared with a stock of 385,329 on the same date in 1884. The estimated product for the coming year is 3,300,000 one-half boxes for 40 weeks. The consumption for the past year was 3,398,000 one-half boxes, of which 2,451,000 was American and 947,000 of foreign manufacture. Thus imports average 28 per cent. of the whole consumption. The probable consumption for the year 1885–86, based on that of 1884–85, is 2,000,000 one-half boxes. The surplus stock of 500,000 one half boxes having been deducted leaves an estimated supply required of 1,500,000 one-half boxes, against a probable production of 3,300,000 one-half boxes. The pots expected to start could produce this supply in less than 20 weeks, or less than half the time they are expected to run. The official report of imports shows a total of 960,000 one half boxes for 1885, against 1,297,890 one-half boxes for 1884. This quantity, while a decrease on 1884, is an increase on every previous year. The price of the imports was .0283 cents per pound, against .0312 cents in 1884, and shows a continuance of a steady decline in prices. "The cost of imported glass at foreign manufacturers' present discounts is equivalent to a discount on American manufacturers' selling card."

The report then goes on to insist on the necessity of measures being taken to avoid losses in the future. It recites the appointment of a committee to consider the state of the trade at the New York meeting last March, whose report advocates the sliding-scale principle. Mr. Bodine says:

"In view of the unusually low cost of material, the committee felt that reduction in cost must be principally in price of skilled labor. The sequence of good demand, good prices and good wages is a fair and natural one; but no more just than the opposite, of decreased prices, producing decreased wages. We cannot escape the operation of these laws except for a very short time. A little prolongation of high prices will advance, just as continued low prices will depress, wages or suspend work." He concludes by stating that "such a fair principle seems to me the most reasonable adjustment of the labor question, and, when fully understood by the workmen, I believe will be preferred."

President Babcock, of the Providence and Stonington Steamship Company, a gentleman highly esteemed and of rare business capacity, was instantly killed Monday evening at a railway crossing in Stonington.

Office of

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August 27, 1885.

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No. 308, 4¼-inch Upright Rim Knob Locks, Tinned Iron Key, Polished Iron Bolts, 1 Tumbler, 12 changes, without Knobs, complete $0.95
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No. 216, Horizontal Knob Latch, 2½ x 3¾, Iron Bolts and Hub ..... .53
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No. 67, Thumb Latches, Wrought-Iron Latch, Japanned, weight 6 pounds per doz ..... .21
No. 6, Pittsburgh Latch, weight 6 pounds per doz ..... .30
No. 217, 2½ and 3¾, Horizontal Rim Knob Latch, Polished Brass Bolt, Iron Hub, per doz 1.21
No. 219, 2½ and 3¾, Horizontal Rim Knob Latches, Polished Iron Bolts, Iron Slide Bolts, Brass Flush Thumb-pieces, per doz. .85
No. 220, 2½ and 3¾, Horizontal Rim Knob Latches, Polished Brass Bolts, Brass Slide Bolts, Brass Flush Thumb-pieces, Iron Hubs, per doz 1.24
No. 225, 2½ and 3¾, Horizontal Rim Knob Latches, with Patent Reversible Polished Iron Bolts, Iron Hubs, without Knobs, per doz ..... .84
No. 227, 2½ and 3¾, Horizontal Rim Knob Latches, with Patent Reversible Polished Brass Bolts, Iron Hub, without Knobs, complete, per doz 1.13
No. 229, 2½ and 3¾, Horizontal Rim Knob Latches, with Patent Reversible Polished Iron Bolts and Iron Slide Bolts, Flush Thumb-pieces, without Knobs, per doz. .98
No 230, 2½ and 3¾, do. do., with Brass Flush Thumb-pieces, per doz 1.03
No 231, 2½ and 3¾, Horizontal Rim Knob Latches, with Patent Reversible Polished Brass Bolts, Brass Slide Bolts and Brass Flush Thumb-pieces, without Knobs, per doz 1.49
No. 314, 4¼, Upright Rim Knob Locks, Polished Iron Bolts, with Patent Reversible Latch Bolt, per doz 1.17
No. 315, do. do., with Stop, per doz 1.22
No. 316, do. do., Brass Key, " 1.49
No. 317, do. do., Brass Bolts and Key, per doz 1.82
No. 330, 4¼ in. Horizontal Rim Knob Locks, Tinned Iron Key, with Stop, 1 Tumbler, 12 Changes. Patent Reversible Polished Iron Bolts, without Knobs, per doz 1.19
No. 331, do. do., with Brass Key 1.49
No. 332, do. do, with Brass Bolts and Key 1.82

Latches Nos. 225, 227, 229, 230 and 231, and Locks Nos. 314, 315, 316, 317, 330, 331 and 332, are made with our new Patent Reversible Bolt, patented Feb. 3d, 1885. To reverse Bolt, partly pull out and turn half around; it will spring back to position. We purpose to make these the cheapest and best ever offered to the trade. Will add a full line of Mortise and all other styles of Locks, with our new Patent Reversible Bolt, very soon. Our Locks are warranted as good as any make, and we will sell them at a moderate margin of profit. We prefer a steady business, which we always have, by offering first-class goods low. We make goods to sell, not to hold.

Broughton's Patent Burglar-Proof Sash Locks. Pat. Oct. 8, 1879.

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No. 7, Iron, Etruscan Bronze, Porcelain Knob, fine finish ..... .30
No. 10, Iron, Etruscan Bronze, Plain Lever, fine finish ..... .21
No. 15, Iron, Etruscan Bronze, Porcelain Knob, fine finish ..... .26
No. 20, Iron, Etruscan Bronze, Ornamental, Plain Lever, fine finish ..... .29
No. 25, Iron, Etruscan Bronze, Ornamental, Porcelain Knob, fine finish ..... .33
No. 30, Iron, Olympian Bronze, Ornamental, Polished, Plain Front, fine finish ..... .39
No. 35, Iron, Olympian Bronze, Ornamental, Porcelain Knob, fine finish ..... .42
No. 40, Iron, Olympian Bronze, Ornamental, Real Bronze Knob, fine finish ..... .78
No. 41, Iron, Olympian Bronze, Ornamental, Plain Lever, Extra Heavy, fine finish ..... .48
No. 42, Iron, Olympian Bronze, Ornamental, Porcelain Knob, fine finish. ..... .54
No. 43, Iron, Olympian Bronze, Ornamental, Real Bronze Knob, fine finish ..... .78
No. 45, Iron, Ornamental, Nickel-Plated, Plain Lever, fine finish ..... .96
No. 50, Iron, Ornamental, Nickel-Plated, Porcelain Knob, fine finish 1.08
No. 51, Iron, Ornamental, Nickel-Plated, Brass Knob, fine finish 1.90
No. 52, Iron, Ornamental, Nickel-Plated, Inlaid Old-Gold finish, with Nickel-Plated Screws, Plain Lever ..... .93
No. 53, do., do., Porcelain Knob 1.58
No. 54, do., do., Real Bronze Knob 2.18
Handsomest design and finish ever offered.
No. 55, Cast Brass, Polished, Plain Lever 1.14
No. 65, " " " Porcelain Knob. 1.17
No. 70, " " " Brass Knob 1.42
No. 73, Ornamental, Bronze Metal Knob, with Screws, extra heavy 1.31
No. 80, Ornamental, Polished, Bronze Metal Knob, extra heavy, very fine 1.76
No. 85, Ornamental, Extra Polished, two Bronze Metal Knobs, very heavy, with Screws 1.91
No. 90, Ornamental, Polished, Extra Heavy, Porcelain Knob, with Screws 1.24
No. 95, Ornamental, Polished, very heavy, Bronze Metal Knob and Bronze Metal Screws 1.96
No. 100, Ornamental, Polished, two Bronze Metal Knobs, extra heavy, with Bronze Metal Screws 2.31
No. 53, Ornamental, Nickel-Plated, very heavy, Porcelain Knob, with Screws 1.96
No. 72, Ornamental, Polished, Cast Brass, Porcelain Knob, extra heavy, with Screws. 1.88
No. 73, Ornamental, Cast, Polished Brass, extra heavy, Brass Knob 2.13
No. 155, Ornamental, Real Bronze Metal, Flat Lever, Extra Polish and Lacquered, with Real Bronze Screws 1.31
No. 165, Ornamental, Real Bronze, Bronze Metal Knob, extra heavy, Real Bronze Screws 1.51
No. 175, Ornamental, Real Bronze, two Bronze Metal Knobs, with Real Bronze Screws, very fine 1.81
No. 185, Ornamental, Real Bronze, very heavy, Bronze Metal Knob, with Bronze Screws 1.80
No. 190, Ornamental Real Bronze, very heavy, two Real Bronze Metal Knobs, with Screws 2.06
No. 210, Ornamental Iron, Iron Knob, fine finish, Etruscan Bronze $0.60
No. 211, Ornamental Iron, Iron Knob, fine finish, Olympian Bronze ..... .75
No. 212, Ornamental Iron, Iron Knob, fine finish, Pompeii Bronze ..... .85
No. 213, Ornamental Iron, Iron Knob, Nickel-plated 1.25
No. 214, Ornamental Iron, Iron Knob, Nickel-plated, Rich Old Gold inlaid 1.50
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold inlaid 1.60
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No. 219, Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold inlaid 1.95
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No. 221, Ornamental Iron, Iron Knob, Nickel-plated, Lemon Old Gold inlaid 2.05
No. 222, Ornamental Cast Brass, Polished and Lacquered 2.65
No. 223, Ornamental Cast Brass, Nickel-plated 3.60
No. 224, Ornamental Real Bronze, Polished and Lacquered, very fine 3.00
No. 225, Ornamental Real Bronze, Silver-plated, very elegant ..... each. 5.00

All Sash Locks from Nos. 20 to 225 packed with Screws.

Per gross.

No. 155, Sash Lifts, Ornamental, Bronzed, with Screws $0.90
No. 160, Sash Lifts, Ornamental, Polished and Bronzed, with Screws 1.10
No. 162, Ornamental Sash Lifts, Polished, Pompeii Bronze finish, with Screws 1.16
No. 260, Ornamental Sash Lifts, Genuine Bronze Metal, with Bronze Screws, per doz. .78

Per doz.

3 in., Extra Tower and Barrel Bolts $0.22
4 in. " " " " ..... .25
5 in. " " " " ..... .33
6 in. " " " " ..... .42
7 in. " " " " ..... .53
No. 20, 6 in. Chain Door Fasteners, Ornamental, with Screws, Bronzed ..... .90
No. 326, 6 in. Chain Door Fasteners, Ornamental, Polished and Bronzed, fine finish .. .98
No. 425, 7 in. Chain Door Fasteners, Real Bronze Metal, with Screws 7.25

Per doz. pairs.

No. 51, Chest Handles, Surface, extra heavy .. $0.44
No. 53, " " " " .. .60
No. 55, " " " " .. .90

Brackets.

Per doz. pairs.

No. 34, 4 x 5, Ornamental Store Shelf Brackets, Japanned $0.44
No. 35, 5 x 6, Ornamental Store Shelf Brackets, Japanned ..... .62
No. 37, 6 x 8, Ornamental Store Shelf Brackets, Japanned ..... .81
No. 39, 8 x 10, Ornamental Store Shelf Brackets, Japanned 1.10
No. 40, 8 x 12, Ornamental Store Shelf Brackets, Japanned 1.29
No. 45, 4 x 5, Ornamental Store Shelf Brackets, Packed with Screws, Bronzed ..... .64
No. 50, 5 x 6, Ornamental Store Shelf Brackets, Packed with Screws, Bronzed ..... .90
No. 55, 6 x 8, Ornamental Store Shelf Brackets, Packed with Screws, Bronzed 1.05
No. 60, 8 x 10, Ornamental Store Shelf Brackets, Packed with Screws, Bronzed 1.77
No. 65, 8 x 12, Ornamental Store Shelf Brackets, Packed with Screws, Bronzed 2.23
No. 70, 4 x 5, Ornamental Library Brackets, Packed with Screws, Bronzed ..... .80
No. 75, 5 x 6, Ornamental Library Brackets, Packed with Screws, Bronzed 1.05
No. 80, 6 x 8, Ornamental Library Brackets, Packed with Screws, Bronzed 1.27
No. 82, 7 x 9, Ornamental Library Brackets, Etruscan Bronze, with Screws 1.64
No. 85, 8 x 10, Ornamental Library Brackets, Packed with Screws, Bronzed 2.07
No. 90, 8 x 12, Ornamental Library Brackets, Packed with Screws Bronzed 2.70
No. 95, 10 x 12, Ornamental Library Brackets, Packed with Screws, Bronzed 2.87
No. 100, 4 x 5, Ornamental Cabinet Brackets, Packed with Screws, Bronzed ..... .97
No. 105, 5 x 6, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 1.23
No. 110, 6 x 8, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 1.45
No. 112, 7 x 9, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 1.83
No. 115, 8 x 10, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 2.26
No. 120, 8 x 12, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 2.84
No. 125, 10 x 12, Ornamental Cabinet Brackets, Packed with Screws, Bronzed 3.08

Drawer Pulls. Per gross.

No. 20, 3½-inch Ornamental Copper Bronze, Packed with Screws $0.80
No. 22, 3½-inch Ornamental Etruscan Bronze, Packed with Screws 1.28
No. 24, 3½ inch Ornamental Olympian Brze., Packed with Screws 1.39
No. 25, 3½-inch Ornamental Pompeii Bronze, Packed with Screws 1.41
No. 35, 4-inch Ornamental Copper Bronze, Packed with Screws ..... .97
No. 37, 4-inch Ornamental Etruscan Bronze, Packed with Screws 1.34
No. 39, 4-inch Ornamental Olympian Bronze, Packed with Screws 1.54
No. 40, 4-inch Ornamental Pompeii Bronze, Packed with Screws 1.54
No. 50, 4½-inch Ornamental Copper Bronze, Packed with Screws 1.17
No. 52, 4½-inch Ornamental Etruscan Bronze, Packed with Screws 1.74
No. 54, 4½-inch Ornamental Olympian Brze., Packed with Screws 1.64
No. 55, 4½-inch Ornamental Pompeii Bronze, Packed with Screws 1.65
No. 27, 3½-inch Ornamental Etruscan Bronze, Packed with Screws 1.35
No. 29, 3½-inch Ornamental Olympian Brze., Packed with Screws 1.48
No. 30, 3½-inch Ornamental Pompeii Bronze, Packed with Screws 1.49
No. 42, 4-inch Ornamental Etruscan Bronze, Packed with Screws 1.46
No. 44, 4-inch Ornamental Olympian Bronze, Packed with Screws 1.63
No. 45, 4-inch Ornamental Pompeii Bronze, Packed with Screws 1.54
No. 57, 4½-inch Ornamental Etruscan Bronze, Packed with Screws 1.64
No. 59, 4½-inch Ornamental Olympian Brze., Packed with Screws 1.84
No. 60, 4½-inch Ornamental Pompeii Bronze, Packed with Screws 1.85

Less 15c. per gross, all above. Per doz.

No. 224, 3½-inch Ornamental Genuine Bronze, Packed with Screws $0.97
No. 239, 4-inch Ornamental Genuine Bronze, Packed with Screws 1.12
No. 254, 4½-inch Ornamental Genuine Bronze, Packed with Screws 1.36
No. 229, 3½-inch Ornamental Genuine Bronze, Packed with Screws 1.08
No. 244, 4-inch Ornamental Genuine Bronze, Packed with Screws 1.31
No. 259, 4½-inch Ornamental Genuine Bronze, Packed with Screws 1.52
No 234, 3½-inch Ornamental Genuine Bronze, Packed with Screws 1.02
No. 249, 4-inch Ornamental Genuine Bronze, Packed with Screws, Old Gold Finish 1.28

Window Pulleys.

Per doz.

1¾ in. Pulleys, in Bulk, Polished Wheel, Plain Front, Extra Heavy $0.15
2 in. Pulleys, in Bulk, Polished Wheel, Plain Front. Extra Heavy ..... .19
2¼ in. Pulleys, in Bulk, Polished Wheel, Plain Front, Extra Heavy ..... .23
2½ in. Pulleys, in Bulk, Polished Wheel, Plain Front, Extra Heavy ..... .27

In papers, 1 cent per doz. more. Polished and Bronzed, in papers, 3 cents per doz. more. Not less than Barrel lots.

Coat and Hat Hooks.

Per gross.

No. 75, Japanned, 15 pounds $0.50
No. 210, Japanned, Bull-Frog Pattern ..... .64
No. 215, Coppered, " " ..... .64
No. 110, Schoolhouse Hook, Japanned, extra heavy 1.12
No. 115, Schoolhouse Hook, Coppered, extra heavy 1.20

Per doz.

No. 130, Harness Hooks, 4½ inch, Japanned .. $0.24
No. 132, " " 5¼ inch, " .. .30
No. 134, " " 5½ inch, " .. .36
No. 136, " " 6 inch, " .. .40

Per gross.

No. 260, Ornamental Coat and Hat Hooks, Bronzed $1.71
No. 265, Ornamental Coat and Hat Hooks, Polished and Bronzed 1.95
No. 266, Ornamental Coat and Hat Hooks, Pompeii Bronze 1.96
No. 290, Ornamental Coat and Hat Hooks, Etruscan Bronze 2.20
No. 295, Ornamental Coat and Hat Hooks, Olympian Bronze 2.27
No. 296, Ornamental Coat and Hat Hooks, Pompeii Bronze 2.28

Per doz.

No. 140, Ornamental 8-inch Bird Cage Hooks, Etruscan Bronze $0.24
No. 145, Ornamental 10-inch Bird Cage Hooks, Etruscan Bronze ..... .28
No. 150, Ornamental 8-inch Bird Cage Hooks, Olympian Bronze ..... .27
No. 160, Ornamental 8-inch Bird Cage Hooks, Etruscan Bronze ..... .24
No. 170, Ornamental 10-inch Bird Cage Hooks, Olympian Bronze ..... .31
No. 180, Ornamental 8-inch Bird Cage Hooks, Olympian Bronze ..... .28
No. 190, Ornamental 10-inch Bird Cage Hooks, Olympian Bronze ..... .36

Casters. Per set.

1⅜, No. 1, Iron Wheel ..... 4½¢
1⅜, No. 2, " ..... 4½¢
1⅜, No. 3, " ..... 5½¢
2 in., No. 1. " ..... 6½¢
2 in., No. 2, " ..... 6¾¢
2 in., No. 3, " ..... 7¼¢
2 in., No. 4, " ..... 7¾¢

Same with Porcelain Wheel, from 1¾¢ to 2½¢ per set more.

Extra, with Lignum Vitæ Wheel, from 2½¢ to 3¢ per set extra.

1⅜, Globe, Porcelain Wheel ..... 10 ¢
2 in., " " " ..... 14 ¢
1⅜ in., " Lignum Vitæ Wheel ..... 12 ¢
2 in., " " " ..... 17 ¢
No. 1, Philadelphia Casters, Iron Wheel ..... 4½¢
No. 2, " " ..... 4¾¢
No. 3, " " ..... 5¼¢
No. 4, " " ..... 5¾¢
No. 5, " " ..... 6 ¢
No. 1, Philadelphia Casters, Porcelain Wheel.. 5¼¢
No. 1, " Lignum Vitæ " .. 5¾¢
No. 2, " Porcelain " .. 6¼¢
No. 2, " " " .. 6¾¢
No. 3, " Lignum Vitæ " .. 7¼¢
No. 3, " " " .. 8¼¢
No. 4, " Porcelain " .. 7¾¢
No. 4, " " " .. 8¾¢
No. 5, " Lignum Vitæ " .. 8¼¢

Per doz.

No. 140, Ornamental Store-Door Handles, extra heavy, Etruscan Bronze $1.60
No. 141, Ornamental Store-Door Handles, extra heavy, Olympian Bronze 1.70
No. 142, Ornamental Store-Door Handles, extra heavy, Pompeii Bronze 1.80
No. 241, Ornamental Store-Door Handles, Real Bronze, very heavy 9.00
No. 375, Ornamental Match Safes, Iron, Pompeii finish, very elegant 1 50
No. 395, Ornamental Match Safes, Iron, Pompeii finish, very elegant 1.75
No. 376, Ornamental Iron, Nickel-Plated, Inlaid, Old-Gold Finish, very handsome, will sell at sight 2.25
No 396, do. do 2.75
No. 475, do. do., Real Bronze, each 1.25

Blind Hinges.

No. 1, for Wood, for Southern trade, 6 doz. sets in a case ..... per case. $3.75
No. 1½, for Wood, extra heavy, for Cold Climates, weight per case, 6 doz. sets, 130 lb. 4.25
No. 7, for Brick Mortise, Self-Locking, Wrought Iron Locking Device, with Inside Fastenings. Patented September 8, 1884. Weight per set, 3 pounds ..... per set. .18
No. 150, Cupboard Catch, Patent, with Screws, Etruscan Bronze ..... per gross. 1.36
No. 1, Blind and Shutter Bowers, Bows Blinds at Two Angles, and Locks when Shut, ½ doz. .56
No. 100, Blind and Shutter Bowers, Bows Blinds at Two Angles, and Locks when Shut, with Screws ..... per doz. .75
No. 290, Ornamental Shutter Knobs .. per gro. 2.10
No 295, Ornamental Shutter Knobs, Pompeii Bronze ..... per gross. 2.24
No. 395, Ornamental Shutter Knobs, Genuine Bronze Metal ..... per doz. 1.25

No. 50.—Two-Third Size.

ORNAMENTAL

Store Shelf Brackets.

Bronzed. Packed with Screws.

PER DOZEN PAIRS, 90 cents.

Ornamental Drawer Pulls.

Full Size Cut of Nos. 42 to 244 and Style of Nos. 27 to 259.

Two-Third Size.—No. 100, 4 x 5.

BROUGHTON'S PATENT

Burglar-Proof Sash Lock.

Full Size.—Nos. 210 to 225.

Ornamental, Real Bronze, with Bronze Screws.

Very Heavy. Our last design.

PER DOZEN - - - $2.40.

NOTICE TO THE TRADE.

Having been the first Manufacturers of Hardware Goods in the country to initiate the system of quoting net bottom prices, we deem it essential at this time, and for our own protection, to make an explanation to the Trade.

None but Hardware Dealers can buy our goods. The quoting of net prices is intended for them exclusively, and to enable us to market our product, dispensing with travelers or middlemen, and place us in direct relations with the Trade. By this system our business has increased so rapidly that we have purchased fou teen (14) acres of ground here, and have made arrangements to enlarge our works fully ten times greater than our present.

Net prices, square dealing and uniform prices to all have accomplished this. It is true that it has brought down on our heads the anathemas of the old Puritan element in the Manufacturing Hardware line, with an odd petty jobber here and there, but the best element of the Trade throughout the country encouraged our efforts by sending in a large number of orders, and have thus compelled us to enlarge our works.

It has also enabled us to reduce our expenses not less than 5 %, which alone is a splendid profit in times like these. We are enabled to market all the goods we can make and place them in the hands of the best trade in this country, and export to Canada, British Columbia, Australia, England and Germany.

In an enlightened age like the present the Trade wants to know where they can buy first-class goods at the very lowest market prices. We believe that we have shown them. Our prices are like the laws of the Medes and Persians—unalterable until further notice—with no deviation under any circumstances, with no "*inside track*" for anybody, but the same prices and terms for all. We are certain that this system must prevail in the Hardware business, as it has in other lines, and the concern that is not in advance of the times nowadays "gets left."

We are not, as our rivals have reported, selling goods at or below cost. On the contrary, we give the Trade and our rivals notice that we are making a fair living profit on all goods made by us. It is true it is a very small margin of profit, but it is greater than loaning out our capital at 2 % per annum, which is about all we could get for it now; besides, selling goods on 15 days' credit enables us to figure and compute as accurately as life insurance companies. We are losing nothing by bad debts. Lost only $25.11 in two years. That being so, we can sell closer than any other manufacturers in the country. No matter how much money they may be able to command, by our new patents we can make the leading staple articles cheaper than the oldest manufacturers in the country. We prefer to do a large business, and it can be done only by marketing our product at a fair margin of profit, by quoting goods at such figures that any dealer can see at a glance that to get lower would mean a loss, and to establish a uniform system of net prices in the Hardware Manufacturing business, so that one man's money, for quantities less than $500, is no better than another's, to lessen the cost of production, and last, though not least, to keep our hands at work all the time, which we propose to do.

We are in the business to stay, and propose to continue in this manner of quoting net rock bottom prices for the exclusive information of the Trade, who are the only parties that can get our goods. We ask the indulgence of the Trade and their substantial assistance by buying our goods if they think it for their interest only.

MANHATTAN HARDWARE CO.

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This is a companion and key to the "Handy Estimate Blanks," and contains full descriptions for their use, as well as a list of all the items ordinarily entering into a building, so arranged as to be a convenient and systematic reminder of what is to be listed in making an estimate. The list of items is provided with ample blank spaces in which still further items may be entered in order to make the list complete for any given neighborhood or to agree with any special plan of construction. It also contains a chapter on Preparing Builders' Estimates, which is of value to the trade at large, whether they employ these particular blanks or not. A considerable portion of the book is devoted to a Selection of Tables, Rules and Formula Useful in Preparing Building Estimates. An Epitome of Mensuration is given, a Table of Multipliers for Facilitating Calculations is presented, and a selection of tables is offered which cannot fail to be of great advantage to all who have estimates to make. The tables of Slating and Tin Roofing are particularly complete. Tables of Wells and Cisterns and Coal Bins, and also the Wages Tables, have been carefully prepared.

Wilder.—List of Tests (Reagents). By Hans M. Wilder; 88 pages, 12mo. $1

This volume contains nearly 1000 chemical tests arranged in 870 paragraphs, alphabetically, under names of authors, and indexed under the names of the substances sought for. Each test is described in a short and concise manner, enabling the reader who is at all familiar with laboratory manipulation to apply them satisfactorily; and even where such previous knowledge does not exist, a careful following of the instructions would give correct results. The book is particularly useful to pharmacists, though the number of tests given for the detection of lead and other deleterious substances in water makes it valuable as well to sanitary engineers and plumbers.

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June 17th, 1885. Tyrone, Pa.

In view of the above notice, published in *The Iron Age* of July 2d, 1885, I have to say that (while the publication is correct) I severed my connection with the Tyrone Company of my own free will and accord, solely with a view of extending my business as metallurgical engineer. My practice hereafter will be to furnish plans, specifications and estimates, as well as to superintend the construction of REGENERATIVE GAS FURNACES, on which there are *no valid patents*, charging a reasonable fee for my work. I have had over 14 years' practical experience in the business, and am prepared to guarantee good work, as well as to protect my clients against infringements.

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A large and valuable lot of small tools, fitted to above Machines, and adapted to the business.

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Will sell cheap for cash and time payments, or will exchange for real estate or lumber, any part of the following machinery, subject to inspection befor purchase

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Furnace Plates for 4 Charcoal Fires, including Valve &c.
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June 17th, 1885. Tyrone, Pa.

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One Engine Lathe, 20 ft. bed, 42 in. swing.
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One Iron Planer, planes 24 ft. long, 62 in. x 62 in. Excellent condition.
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Two Durrell's 7 Spindle Nut Tappers.

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IN GOOD ORDER.

One 20 x 48 Corliss Engine.
One 18 x 36 Hor. Engine, built by Jacob Navler.
One 14 x 14 Vertical Engine, New York Safety Steam Power Co.
One 14 x 20 Hor. Engine, Campbell & Rickards.
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One 8 H.-P. Shapley Engine and Boiler.
One 6 " Baxter Engine.
One 50 " Vertical Tubular Boiler.
One 50 " Locomotive Boiler.
One 60 " Hor. Tubular Boiler.
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One 16 x 6 Harrington Lathe.
One 17 x 6 New Haven Lathe.
One 16 x 6 Hartford Engine Lathe.
One 26 x 12 Engine Lathe. New Haven.
One 38-inch swing Column Drill. New Haven.
One 50-inch Vertical Boring Mill.
Also complete outfit for a Sash and Door Factory, including Planers, Moulding Machines, Band Saws, Tenoning Machines, Upright Moulding Machines, Scroll Saws, Mortiser Saw Benches, &c., all modern Tools, but little used.

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10	"	"	156	"	207
12	"	"	178	"	237
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20	"	"	250	"	298
25	"	"	275	"	347
30	"	"	350	"	398
35	"	"	375	"	456
40	"	"	428	"	514
50	"	"	556	"	656

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300 tons R. R. Spiral Spring Steel.
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FOR SALE.

One Harris's Corliss Engine, 16 x 42.
One Corliss Engine 14 x 48.
Two Horizontal Tubular Boilers, 50 H.-P.
One No. 5 Knowles Steam Pump Nearly new.
" No. 4 I. B. Davis Boiler Pump.
" 3-in. one 4-in., Fales & Jencks Rotary Pumps.
300 ft. 4-in. Cast-Iron Pipe, flanged.
D. B. CRUICKSHANK.
243 Dyer St., Providence, R. I.

For Sale.

Second-hand Tanks, large assortment.
New Mess Pans, 150,000.
New Mule Shoes
Scrap Iron and Old Metals.
BUSSENIUS, CUNLIFFE & CO.,
12th and Washington ave.,
Philadelphia.

WANTED.

A second-hand BRADLEY HAMMER in good order. Give *size*; state where it may be *seen*, and *bottom prices*. Also two Power Drop Hammers, with lifters 200 lb. and 400 lb. or thereabouts.
"B,"
Office of *The Iron Age*, 83 Reade St., New York.

Wanted to Buy.

Old Iron and Steel Wire Rope, Burnt Iron, &c.
Address, stating price, quantity, &c.
SITES, GILL & CO.,
222 and 224 So. Third Street,
Philadelphia, Pa.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, August 26, 1885.

Scotch Pig.—The market is a little steadier. We quote makers' brands as follows:

Coltness, alongside, Glasgow			48/6
Langloan,	"	"	47/6
Gartsherrie,	"	"	46/6
Summerlee,	"	"	46/6
Carnbroe,	"	"	46/
Glengarnock,	"	Ardrossan	46/6
Eglinton,	"	"	41/6
Dalmellington,	"	"	43/
Shotts,	"	at Leith	48/

Lighterage from Ardrossan to Glasgow is 1/ ₽ ton.

Cleveland Pig—Is unchanged. We continue quotations, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry		36/6
"	No. 2 "	35/
"	No. 3 "	32/6

Bessemer Pig—Is unchanged. W. C. Hematites are quoted 43/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is irregular. We quote at works:

		£	s.	d.	£	s.	d.
Staff. Ord.	Marked Bars	7	10	0	@	.....	
"	Medium "	6	0	0	@	6 10	0
"	Common "	5	10	0	@	5 15	0
Hoops, 20 W. G. and over.							
"	Common Best	6	15	0	@	.....	
"	Medium	6	5	0	@	6 10	0
"	Common	6	0	0	@	6 7	6
Sheets, 20 W. G. and under.							
"	Ordinary Best	7	15	0	@	8 5	0
"	Common	7	5	0	@	7 15	0

Steel Rails—Are unchanged. We quote £4. 15/ @ £4. 17, 6, f.o.b. shipping ports.

Old Rails—Are unchanged. We quote Old D. H's, c.i.f. New York, £3 @ £3. 2/6.

Scrap.—The market is unchanged. We quote Heavy Wrought £2. 10/ @ £2. 15/, c.i.f. New York.

Copper.—The market is weaker. We quote Best Selected, £46 @ £46. 5/, and Chili Bars, £42. 15/ @ £43. 5/.

Tin.—The market is steadier. Straits Tin, spot, is quoted £91. 15 @ £92. 5/, and futures £90. 15/ @ £91. 5/.

Tin Plates—Are unchanged. We quote:

Tin Plates, 10x14, 1st qual. Charcoal			19/6 @ 21/6
"	"	2d " "	18/6 @ 19/
"	"	1st " Coke	17/6 @ 18/
"	"	2d " "	14/ @ 14/6

Spelter.—The market is a little firmer. We quote Ordinary at shipping ports, £14. 5/.

Lead—Is quiet. We quote Common English Pig, £12. 2/6.

Freights.—Steam from Glasgow to New York, 1/ @ 2/.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, August 26, 1885.

There are substantial signs of improvement in trade from week to week since about August 1, but progress is slow. The underlying facts which serve as a basis are the enormous crops of cotton and corn soon to be gathered, together with a liberal yield of almost all the other agricultural products. The assurance thus afforded already acts as a stimulus more or less perceptible in nearly all departments of business. The first to notice a reactionary feeling were the New York dry-goods jobbers, whose customers began to appear earlier than usual, some of them hastening to participate in the Grant obsequies, and from this quarter the intelligence coming to hand is uniformly cheerful. According to intelligent authority among this class of tradesmen, the past week has been the most active in three years, and the more noticeable because influenced solely through the legitimate wants of all markets. As the week closes, the tone is stronger through the steadiness of an increasing demand, with indications of a large trade in sight. Most values are unremunerative to manufacturers, but with stocks being reduced all prices are hardening, while some have been advanced.

The single feature that challenges attention is the heavy break in wheat foreshadowed in these columns a fortnight ago. On Saturday prices dropped to a lower point than before since the "pegging up" of last spring, and instability is characteristic of the closing market. It is observed, however, that, although the decline in wheat lately is at the rate of 4¢ @ 5¢ ₽ bushel a week, prices are still higher than they were one year ago. The speculative reaction is especially severe in Chicago, the leading journal there remarking that "immense sums of money have been lost by the parties who were on what is technically known as 'the long side.' The leading articles, wheat and provisions, have suffered the most, especially barreled pork, which has sold down fully 15 %, while the decline in the cereal was scarcely half that amount. In both cases the cause for heaviness was in effect the same as that of which manufacturers have so long and so loudly complained. It is overproduction. The stocks of both are so large as to form a heavy weight on the necks of those who have been interested in sustaining prices, and their size has at last forced large concessions by holders." In New York shippers of grain were benefited by the decline, but the demand for export is hardly commensurate with the increasing visible supplies. Grain freights from the West by the water route are more active than for several weeks, on the basis of 6⅜¢ @ 6½¢ for wheat through to New York.

In general trade the accounts from all quarters are of a cheerful tenor, especially at the South, where new crop of cotton is coming in freely, and at Western points purchases are made with more confidence. Commenting on the improvement in Canada, the Toronto *Mail* ascribes the change largely to the promise of a good harvest, which the farmers of Ontario expect will be at least fully up to the average. These views are borne out by the returns from leading clearing houses throughout the United States, which exhibit an increase of 18 %; outside of New York, 7 %. This is a great improvement, both over the previous week and the corresponding week in 1884, but not up to the same time in 1883. Memphis gained 29½ %, New York 23½, Boston 11½, Philadelphia 11, Chicago 9½, St. Louis 4. Cincinnati is more active in all departments. In the labor world, while some mills are starting up and new orders are in course of execution, evidence of depression, as a rule, is very perceptible. In textiles there is a decided revival.

The Stock Exchange market during the past week has been irregular and generally lower. An attempted advance in repeated instances was summarily checked, there being manifest a disposition to sell on each succeeding rally. On Friday, as on the day preceding, the Omaha stocks showed unusual strength, growing out of a rumored closer alliance with the Chicago and Northwestern. The Coal shares were generally steady, despite a reduction of 10¢ @ 15¢ ₽ ton by the Delaware and Hudson Company. On Saturday prices ruled a little higher, the disastrous rivalry of the West Shore being considered a thing of the past. The Burlington and Quincy and Manitoba advanced on a new election of directors supposed to be favorable to joint interests. On Monday prices declined on realizing sales. On Tuesday the drift toward a lower level was more decided, due in part to the unfavorable position of the coal trade and possible difficulties in the South Pennsylvania negotiations. To-day there was no special change, the movement either way being fractional. Quotations are as follows: Lackawanna, 101⅞; Delaware and Hudson, 86⅛; Jersey Central, 49⅝; Erie, 16¼; Reading, 22½; Lake Shore, 72½; New York Central, 100¼; Union Pacific, 51⅜; St. Paul, 79; Northwestern, 101¼; Omaha, 35⅛; Kansas and Texas, 23½; Texas and Pacific, 16⅜; Louisville, 46¼; Denver, 11½; Northern Pacific, 20¾; do. preferred, 48⅛; Oregon and Transcontinental, 19⅞; Ontario and Western, 13¾; San Francisco, 19½.

The weekly bank statement shows a further reduction in the surplus reserve to $58,341,475, compared with $64,724,100 on August 1, and $31,649,550 at the corresponding time last year. Loans were increased $2,614,100, principally on account of greater activity in stock speculation. There was an increase of $1,358,400 in specie, notwithstanding that the Sub-Treasury operations were against the banks. Deposits increased $3,565,600, due mainly to the expansion in loans. The market for sterling was weaker to-day and posted rates were reduced ½¢ on the £ to $4.84 @ $4.84½ and $4 86 @ $4.86½. Money is easy at 1½ @ 2 %. Commercial paper is in good demand for short dates, while long-time notes are neglected. We quote 60 to 90 days' indorsed bills receivable at 3 @ 3½.

The exports from this port for the week, exclusive of specie, were valued at $5,107,139, against $7,294,978 the previous week and $6,899,408 for the corresponding week in 1884. Since January 1 the total valuation of exports is $215,380,613, as against $206,514,970 for the corresponding time in 1884. Included in the exports of the week wese 74,110 barrels of wheat flour, 476,134 bushels of wheat, 287,411 bushels of corn, 12,377 bales of cotton, 7,231,696 gallons of petroleum, 4,040,341 ℔ of cut meats. The imports for the week at the port of New York were $1,469,970 above those of the previous week, the total being $8,951,871, of which near $3,000,000 represents dry goods. The aggregate since January 1 is $249,547,087, against $287,459,042 for the corresponding time in 1884. According to the Custom House reports the imports of specie and bullion at New York last week amounted to $28,920, and the exports of specie for the same time were $351,548. The total imports and exports since January 1st were $7,638,034 and $18,060,590, as against $12,440,413 and $47,106,462, respectively, in 1884.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 6 per cents	103⅛	—
U. S. 4½s, 1891, coupon	112⅞	113⅛
U. S. 4s, 1907, coupon	122⅞	123⅛
U. S. Currency 6s, 1895	126	—
U. S. Currency 6s, 1896	128	—
U. S. Currency 6s, 1897	130	—
U. S. Currency 6s, 1898	132	—
U. S. Currency 6s, 1899	134	—

The proposed West Shore consolidation has been sanctioned by stockholders representing $47,500,000 of bonds. A legal impediment is presented by the Attorney General of Pennsylvania, but the Pennsylvania Railroad Company, on the other hand, maintain that they secured their charter prior to the adoption of the new Constitution, and that they are, therefore, exempt from its provisions prohibiting the merging of parallel or competitive lines.

Metal Market.

Copper.—There has been, on the whole, a quiet market during the week, with increased inquiry for Arizona Copper. Manufacturers are still in treaty with the Lake people. We quote at the close Lake Superior, 11¢ @ 11¼¢; Electrolytic, 11¢; Arizona, 10½¢ @ 10¾¢, and Baltimore, 10½¢ @ 10¾¢. In London Best Selected receded from £48.10/ during the week to £48, and Chili Bars were all the time steady at £43.5/ till yesterday, when they dropped to £42.17/6 and stayed there. According to Messrs. Rickards & Bee, London, August 11, the import into England during the first seven months was 77,353 tons Fine, against 62,664 in 1884, and the export 37,725, against 41,709, making the excess retained over last year 18,673, or about at the rate of 32,000 per annum. Export of Pyrites from Spain during the first five months, 342,265 tons, against 265,372 in 1884 and 265,007 in 1883; of Ingot Copper, 11,688 tons, against 6223 and 9697. For manufactures in this market dealers ask 16¢ for New Sheathing Copper, 17¢ @ 17½¢ for Braziers, 18¢ for Bolts, 18¢ for Bottoms. American Yellow Metal Sheathing and Nails, 11½¢; Rod, 15¢, and English, in bond, 13¢. We are cabled from London this afternoon that the market is weaker, Chili Bars being quoted £42.15/ @ £43.5/, and Best Selected £46 @ £46.5/.

Tin.—In sympathy with the London market ours has been very quiet at 21½¢ for Straits Tin, jobbing, at which it closes, there being no larger spot dealings, while London cables spot £91. 15/, and three months, £91. We are cabled thence, this afternoon, that the market is steadier. *Tin Plates*—Have been firm, but very quiet, at the following quotations for large lines, ordinary brands, ₽ box: Charcoal Bright, $4.87½ @ $5.50; do. Ternes, $4.50 @ $4.75, and Coke Tin, $4.50 @ $4.62½. The Liverpool market has been firm, Charcoal at 16/ @ 17/6, and Coke at 14/3 @ 14/6. From London we are told that the market is unchanged.

Lead.—The feature of the market is the fact that 2000 tons of Richmond, released from attachment, are going to be thrown on it, and that the metal is now paralyzed with a petty jobbing trade during the week at 4¼¢ for Common Domestic, while St. Louis ranges between $4.15 and $4.20. At the quotation of £11. 17/6 for Soft Spanish Lead in London there was in the middle of August an advance of about 8 % over and above the average price since January 1. On January 1, 1883, the quotation was still £13. 6/4, and the average of 1883 was still 11 % behind that of 1882, and 29 % lower than the average of the preceding 25 years. Export of Lead from Spain during the first five months, 51,236 tons, against 52,119 in 1884 and 50,959 in 1883. In London Soft Spanish has been steady during the week at £11. 12/6. Manufactures are quoted as follows: Lead Pipe, 5¼¢ ₽ ℔; Sheet Lead, 6¼¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York, 3¢ ₽ ℔. Shot, Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-℔ bags, 1¢ ₽ ℔ extra. We are cabled from London this afternoon that Common English Pig is selling at £12. 2/6.

Spelter and Zinc.—No greater activity has developed than before, but there is, nevertheless, a stiff market at $4.35 @ $4.40 for Common Domestic, and at 4¼¢ for Silesian. The latter advanced in London from £14 to £14. 7/6 during the week. The average price of Spelter in the London market in 1883 was 9¾ % lower than the average of 1882, and 22 % lower than that of the last 25 years. In 1884 the metal still further declined 4¼ %. In Breslau the average price in 1884 was 28.02 marks, against 29.42 in 1883. Up to the middle of August the price had given way to 26 marks, in order to recover to 26.60 ₽ 100 kg. when it became known that the restriction of output had been agreed to on all hands on the Continent. Calamine exportation from Spain during the first five months, 17,114 tons, against 14,958 tons in 1884 and 17,258 tons in 1883. We quote Bertha Refined 7¾¢ @ 8¢, and *Sheet Zinc*, which has advanced, $5.20 @ $5 40, Domestic. From London we are cabled that the market is a little firmer.

Antimony.—Greater activity is noticeable at 9¼¢ for Cookson and 8¾¢ @ 9¢ for Hallett. The latter is steady in London at £37.

Foreign Markets.

FRANCE.

PARIS, August 12, 1885.—*Metals.*—There has been more business done at irregular and finally lower prices, the closing quotations being for *Copper*, Chili Bars, 113 @ 116 francs ₽ 100 kg.; Ingots and Slabs, 118.75; Best Selected, 122.50, and Pure Corocoro Ore, 115; *Tin*, Banca, 250; Billiton, 249; Straits and Australian, 252.50, and English, 247.50; *Lead*, 30.50 @ 31.50, and *Spelter*, 36.50 @ 36.75 francs. *Iron.*—In this city Flooring Iron is still selling at 13 francs, and Merchant at 13.50. While the Chamber and Senate were still in session it was hoped that something decisive would be done about public works in this city, but, as everything has been left in abeyance, even the Metropolitan Railroad, there is little prospect for Structural Iron being any higher than what it is during the present season. Old Rails go begging at 7.50 francs ₽ 100 kg. We quote Charcoal Iron, 24; Sheets, 17 @ 25, and Wire Nails No. 18, in bulk, 27 francs. Although in the Northern Department rolling mills have curtailed production, there is no revival and no improvement in prices, consumers not coming forward, and business there is stagnant. In the Ardennes prices are drooping fast; there are too many foundries and too little demand for their goods. The Champagne forms an exception; rolling-mill products there, esteemed for their good qualities, meet with a good sale. In the Meurthe and Haute-Marne there is little doing and decided weakness on the basis of 14 @ 15 francs for No. 1 Coke Iron. *Coal* is dull, but sustained.—*Moniteur des Intérêts Matériels.*

BELGIUM.

BRUSSELS, August 12, 1885.—*Iron.*—The Belgian Iron market is in an uncertain mood and a kind of torpor begins to prevail. It is asserted that it is chiefly excessive production in this country which weighs down prices among us, and that things have arrived at a point which imperatively demands the application of some energetic remedy such as a reduction of output; this being the case, Belgian Ironmasters are soon to assemble and consult what course is to be pursued in the common interest. Meanwhile, the market is heavy, large transactions are scarce and prices more and more difficult to uphold. The last Steel Rail adjudication was distributed at 129 francs ₽ ton, between Cockerill, the Angleur, Thy-le-Château and the Ougrée Works, 21½ kg. to the running meter 11 cm. high. Italian orders for 10,600 tons of Steel Rails have been received besides, and 3600 tons thereof the Ougrée Company will execute. It should be stated that although there is considerable dissatisfaction as to the general situation of Iron industry in Belgium, as stated above, none of the works are positively idle, all are in receipt of orders, small though they may be, to keep them going, but margins are very much reduced. We quote Foundry Pig, 4.60 @ 6.50; Puddling do., 4.00 @ 4.70; Merchant, 10.25 @ 11.75; Beams, 10.25 @ 11.25; Angles, 11.25 @ 13.25 and Sheets, 13.25 @ 23.25 francs ₽ 100 kg. *Coal* has become very dull, but is sustained at 4.25 @ 6.50 francs for Steam Coal.—*Moniteur Industriel.*

GERMANY.

HAMBURG, August 12, 1885.—*Iron.*—Our Dortmund correspondent writes: Iron ore has continued tending upward; Pig Iron has been dragging, if we except puddling Pig. Spiegel is still taken for export steadily, but in the absence of a home demand it is rather weak. Foundry Pig suffers from the stagnation among foundries. Bessemer, Thomas and Luxembourg Pig neglected and weak. In the rolling mill branch Bar Iron remains inanimate and weak; only Structural is wanted and firm. While all Thin Sheets enjoy a good demand, the contrary is the case with Plates. Wire Rods are more wanted for export, but have not improved. The Steel branch is in good condition and active, but the bulk of orders is for export, mostly railway material, at prices so low that there is hardly any margin left. Larger commands have now dropped in for Domestic railroads, but as there are so many makers they are scattered; Steel Rails are firm. Machine shops, foundries, bridge-building concerns, boiler works, locomotive and car shops, are tolerably busy. Spiegel may be quoted 45 @ 49; nothing but a reduction of output will help the market. *Metals.*—To the Silesian and Rhenish agreement of Spelter producers to restrict the output for four years to that of 1884, the Belgian, French and Spanish makers have now also acceded, with the sole exception of one concern, turning out 6000 tons annually, in Belgium. Continental production is thus restricted to 220,000 tons of 2240 pounds. England produces 20,000 tons and no more. In this market only Spelter has been improving; other metals have remained unaltered. —*Borsenhalle.*

HOLLAND.

ROTTERDAM, August 8, 1885.—*Tin.*—The last Government sale came off at 55.50 guilders ₽ 50 kg. for Banca, and 55.37½ for Billiton.

July Tin Statistics.

	1885. Slabs.	1884. Slabs.	1883. Slabs.
Banca stock on warrants, July 31	49,997	45,301	21,817
Billiton stock here and at Amsterdam, July 31	31,916	44,861	74,115
Total	81,913	90,162	95,932
Banca deliveries since June 3	19,709	6,500	12,400
Billiton deliveries since June 3	18,979	6,768	4,428
Total	38,688	13,268	16,828
Banca deliveries since January 1	76,150	67,207	74,286
Billiton deliveries since January 1	71,347	59,600	51,594
Banca afloat	1,800	18,000	10,000
Banca held for coming sales	102,701	61,149	108,728
Billiton afloat	18,706	32,487	28,070
Price of Banca	g. 56	g. 52	g. 57¼
Price of Billiton	g. 56	g. 50	g. 56¼

The market has remained quiet since, at 55.75 for Banca, spot, and 55.50 for Billiton, October delivery.—*Koch & Vlierboom.*

AUSTRIA

VIENNA, August 11, 1885.—*Iron.*—The market has been moderately active at unaltered prices. On behalf of the combined Steel Rail makers the Austrian Alpine Iron Works Company sold to the Bihar Branch Railroad Company 6200 tons of Rails, 2500 of which to be delivered at the close of the current year, and the balance in 1886; another lot of 800 tons from the same combination was sold, deliverable in 1886, to the Szentes-Mezotur Railroad Company. Iron is steady; Pig, 47 @ 56; Merchant, 100 @ 125; Sheets, 160 @ 175, and Beams, 105 @ 115 florins ₽ ton.—*Austrian Trade Journal.*

SPAIN.

MADRID, August 12, 1885.—Official returns have just been published of the

Shipments from Spain during the First Five Months.

	1883. Tons.	1884. Tons.	1885. Tons.
Calamine	17,258	14,958	17,114
Pyrites	265,007	265,372	342,265
Iron Ore	1,781,886	1,912,234	1,226,377
Ingot Copper	9,597	6,223	11,688
Quicksilver	900	1,085	667
Pig Lead	50,960	52,119	51,235
Total	2,125,108	2,251,991	1,649,346

Revista Minera.

CHILI.

VALPARAISO, June 26, 1885.—*Copper.*—Our market opened quiet at $17.10, but later on, under the stimulus of encouraging cablegrams and a decline in Exchange, the price rose to $17.35, in order to wind up with a slackened demand at $17.12½ per quintal, which is equal to £43. 15/ with a 30/ freight, per steamer. Fortnight's sales, 13,150 quintals. *Nitrate.*—The June curtailment of output caused an improvement to $3.35 for 95 %, and a large business was done "to arrive." From Iquique it is stated that 75 % of the entire year's production has been disposed of. The market closes firm at the above figure, which, with 30/ freight, is equal to 9/11 in England. Sales, 1,191,000 quintals, without counting the "future" transactions at Iquique, made on private terms. Charters for the fortnight run up 32,500 tons for Europe and none for the United States. *Coal* has been neglected at 29/, West Hartley, and 24/ Australian. *Exchange*, 90 days, 25¾d.—*Weber & Co.*

The Valley Machine Company, East Hampton, Mass., manufacturers of the "Acme" and "Valley" steam pumps, have through this entire season had a first-class demand for their pumps, having supplied them to many concerns who formerly had them in use, in some cases in very large sizes. The beauty of their pumps is their simplicity in construction, not being liable to get out of order, lasting for a long time and doing good service.

The Chapman Valve Company, Indian Orchard, Mass., are adding two new large brick buildings to their already extensive plant at that place. This company have probably the largest and most complete factory for making valves, hydrants, water gates, &c., that there is in the world. They are running their large works to their full capacity, and report the demand for their goods larger than it has ever been before.

Trade Report.

General Hardware.

Among the orders that are being received, those from the Southern States are referred to as especially satisfactory, indicating, as they do, a healthful condition of trade. They are not, however, of as large volume as heretofore, there being a growing tendency to purchase more frequently, and, consequently, in smaller quantities. Trade in other sections is fair. Reports from Western travelers are to the effect that the merchants are somewhat undecided as to their course, but that the indications are that there will be good trade this fall. Stocks are light in hands of both manufacturers and merchants, and in some lines orders are not promptly filled.

BARB WIRE.

The market is quiet and unchanged. Sellers frequently make the attempt to secure better prices, but do not show very much persistence in this course. The volume of business is moderate in this immediate vicinity, but orders for delivery in the South show some improvement. We quote 4.35 cents to 4.40 cents for carload lots of Four-Point Galvanized Barb Wire, and 4.50 cents to 4.60 cents for small lots.

NAILS.

The continuance of the call for Nails from the West, due to the practically complete cessation of work at the mills there, relieves this market of any pressure which might otherwise come upon it. Many Eastern mills are well booked for the immediate future, and since the disappearance of needy sellers in this market a firmer tone prevails. The low figures for Iron Nails on dock cannot now be obtained, and for store lots $2.10 to $2.15 is the prevailing quotation. Steel Nails are quoted $2.30 to $2.35 from store, but the large difference in price and their scarcity is undoubtedly heavily curtailing the consumption. So far as the local demand for Nails is concerned, it has shown a slight improvement, chiefly in the number and in the urgency for small lots.

MISCELLANEOUS PRICES.

The manufacturers of Cradles and Snaths had a meeting last week at Niagara Falls, at which all the leading manufacturers were represented. After discussion the prices and terms of last season were reaffirmed without change. In addition to this, in order to secure regularity in prices, action was taken withdrawing all agencies. Measures were also adopted to prevent purchasers from securing the extreme quantity discounts unless they are entitled to them.

Steel goods remain in the unsatisfactory condition they have been in for some time, there being no concert among the manufacturers, and no prospect of any. Some heavy orders have indeed been placed for next season, which would probably prevent any combination if it were attempted.

The Scythe market is disturbed by sales and deliveries reported to have been made at lower figures than the prices determined on by the manufacturers for the coming season, and the apprehension is expressed that the combination cannot be maintained while these goods are in the market. Efforts are, however, being made to remove the difficulty, and hopes are expressed that they may be successful.

Some manufacturers in Pittsburgh, Cleveland and other points in Pennsylvania and Ohio are showing a disposition to stiffen prices on Bolts and Heavy Hardware, on which in some cases quotations have been withdrawn. No definite advance has, however, been made, and it remains to be seen whether or not better prices will prevail.

Tinware, Pieced and Stamped, is irregular, and prices are seriously demoralized.

Allen's Combined Anvil and Vise, manufactured by the Palmyra Scale Works, Palmyra, N. Y., a description of which is given among our Hardware Novelties on page 31 is sold at $2.50, subject to a discount of 40 per cent.

Paine, Diehl & Co., 12 Bank street, Philadelphia, quote Bauer's Patent Link Spanner and Pipe Wrench as follows, subject to a discount of 20 per cent. :

5-inch.	8-inch.	12-inch.
50c.	75c.	$1.25

Larger sizes are in preparation, and will be put on the market before long. Bauer's Patent Pipe and Bolt Vise is sold at a discount of 25 per cent. from the following list :

No. 1, holding ⅛ to 1¼ inch Tubes, &c..... $2.50
No. 2, holding ⅛ to 2½ inch Tubes, &c..... 4.50

Their Bryant's Egg Beater, a description of which is given among our Hardware Novelties on page 31, is sold at $1.80 per dozen, subject to a discount of 25 per cent.

The announcement on page 18 of the revised net prices of the Manhattan Hardware Company, Reading, Pa., and the statement they make concerning their system of quoting "net bottom prices" and its advantages, will be of interest to the trade.

THAT PETITION.

From a number of letters which we have received from the trade in regard to the "petition" from certain jobbers, to which we referred last week, we lay the following before our readers. The first is from a Hardware man of this State, who refers especially to the alleged "mutual interest" of jobbers and the manufacturer, and puts in a claim for the retailer as an "economical distributor : "

To the Editor of The Iron Age : Being what is termed a retail dealer of Hardware, not "necessary to the economical distribution of goods to small points"—ha! ha!—I feel as though I might have something to say about this "economical distribution." I fail to see wherein you are doing any one an injustice in quoting prices as you do, except it may be the retailer, but it seems they are not to be parties who are finding fault. It is plainly understood by all intelligent dealers that your quotations are about what retailers could go into the market and buy for, the jobber, of course, getting a fair percentage beyond your quotations. I see no reason for the jobbers to complain, unless it may be, as I suspect, that they want the manufacturer to furnish the goods at just the cost of manufacture, so that their profits may be larger. In that case the jobber would desire to make it appear that "the manufacturers' and jobbers' interests were mutual" —a proposition which the manufacturers are very slow to accept. I fail to see why the manufacturers are so dependent on the jobber for distribution, for does not the retailer do the distributing in the end? Besides, I fail to see why $1 of a retailer's money should not count 100 cents just as well as a jobber's dollar. To illustrate : Something over a year ago a salesman came to my place with a new patent article which he had been through the town exhibiting and could get no one to take hold of. Some had a stock of other kinds something similar, others laughed at it, while others said, "Produce a demand and we will then purchase." I thought I saw merit in the article, and at once went to work showing the article, and succeeded in creating a demand and got up a good trade, which might have been increased but for the interference of the manufacturer, who thought his interests and the interests of the jobber were mutual. The manufacturer went to one of these same parties who had refused to purchase till I had created a demand, and sold him the same article at a jobber's discount more than I could get, because, forsooth, he was a jobber, and that after I had done all I could to introduce the article and had caused a demand. What is the consequence? This same jobber has now cut the price till the margin for the retailer is very small, and he would, if he should get hold of one of my customers, sell at just what I have to pay, and then make a good profit. Their interests may be mutual, but why not the manufacturer reward the parties who helped him get his goods started? A great many men keep perhaps one man on the road a small portion of the time, and set themselves up as jobbers, and, the "manufacturers' interests being mutual with the jobber," sell them goods so that they are able to cut the throats of the smaller trade. Why should not the manufacturers supply to responsible parties at the same price, and then the small trade would be encouraged, and the man who paid strict attention to business and used economy would stand on the same footing with his jobbing neighbor, because he pays just as well, although perhaps not as much at one time. Please continue your quotations and oblige JUSTICE.

The following pungent communication is from a Hardware merchant in Ohio :

If the asinine proposition, petition—or, more properly, jobbers' kick—is to be considered at all, we, as Western retailers, want a hand in it. Allow us to suggest for them an old-fashioned camp meeting at which they may condole with each other and relate their grievances, these grievances to be based on a truthful statement as to how they have sold goods the last two seasons, how they have kept faith with the manufacturers, and how they have avoided sworn statements at the season's settlement, and, we assure you, the secretary of the experience meeting will not need his pencil, and will have no minutes for another gathering. For all the trouble that is now brewing, if it is brewing, the jobbing element is to blame. They have clashed with each other until there are no respectable prices left on anything, and yet in the face of this fact that has become notorious they gather their loins about and in one mighty effort, with sublime gall, bring forth this : "We believe that the interests of manufacturers and jobbers are mutual." Gentlemen, I venture I express the sentiment of 90 in every 100 retailers when I say we don't believe you. You have no interests that are not strictly your own—in so far as you can make them so. Occasionally you are compelled to come to a manufacturer's terms, and this is where you place your small idol of mutual interest—to be kicked down and dashed to pieces by the first traveling salesman you start on a trip. As retailers we know you, and we know that, because you are dealing with a better posted class of men than ever before, the gauze through which you seek to blind us is exceedingly frail. Do you suppose for a minute that we will buy goods that are not known, not advertised, and the market value of which we have no means of knowing? If your object is to keep manufacturers from advertising their goods in *The Iron Age* or any other paper, and making prices that are known market prices, allow us, in our conceit, to say you are failures.

The writer of the following letter, referring to the same general subject, alludes to the manner in which under his observation the jobbers encroach on the retailers' trade :

To the Editor of The Iron Age : As a retailer I want to shake with "Jack Plane." I think his suggestion for the retailers to discontinue their subscription to trade papers publishing prices would at once settle the difficulty complained of. Why did you not publish the names of those enterprising jobbers who signed the petition? We would like to know who they are. I think jobbers have all they can attend to if they will mind their own business and not interfere with trade papers and the retail trade. Some jobbbers and manufacturers are far worse than the trade papers in sending their catalogues and discount sheets to any and every body. For instance, the Gun, Revolver and sporting trade send their price lists to any person writing for one. The consequence is sporting men know what goods are worth as well as those in the trade. The small repair shop with no stock receives catalogues and discount sheets from everybody, and has them laying about for the perusal of all. Then, again, Chicago jobbers come here and sell Lawn Mowers to drug stores; Cutlery, Fishing Tackle, &c., to a confectioner; Barb Wire, Scythes, Shovels, Spades, &c., to a grocery store; Screws, Bolts, Horse Nails, Shoes, &c., to a blacksmith; Locks, Butts, &c., to carpenters and builders. Any of these parties can get a catalogue and prices on any goods they may want. Why don't the jobbers confine themselves to the legitimate trade? The course some of them pursue does more to demoralize prices than any trade paper ever did. As a rule, none but the best retail trade take such a paper as *The Iron Age*; consequently, drug stores, grocery stores, carpenters and blacksmiths get no information from that source; still they keep posted. How? Ask some of the one-horse cross-roads jobbers in Chicago or Milwaukee. I do not mean to infer that all jobbers do this, but all the retail jobbers do —those that make great pretension and carry no stock, but call themselves jobbers. If the legitimate retail Hardware trade could induce this class of so-called jobbers to step down and out, either job or retail would do more toward righting the wrongs complained of than suppressing publication of prices in trade papers. RETAILER.

A. E. DEITZ,

Brooklyn, E. D., for whom Durrie & McCarty are agents, 97 Chambers street, in his recent catalogue illustrates his well-known line of goods, with the addition of some patterns not represented in his former issue. On its first page it gives an engraving of the medal awarded at the New Orleans Exposition, and a circular to the trade referring to the special features of the goods. The following sheet of discounts is also issued :

Pages.	Discount, per cent.
2 and 3, Drawer Locks	40
4 and 5, Drawer Locks	45
6 and 7, Drawer Locks	30
8 and 9, Rim Night Latches	30
10, 11, 12, Rim Night Latches	30&10
13, Latches and Locks	30
14, 15, 16, Rim Store Door Locks	30
17, 18, 19, Mortise Store Door Locks	30
20 and 21, Mortise Night Latches	30
22, 23, 24, Padlocks	40
25 and 26, Blanks and Fitted Keys	30

Terms : Cash within 30 days from date of invoice, with exchange on New York.

Among the articles not listed in former catalogues are the following, on which the discount is 45 per cent. :

Flat Steel Key Brass Cylinder Desk or Box Lock.

	Per doz.
No. 41, 2 x 1⅝ inches, for ⅞-inch Wood, three Tumblers, two Keys	$9.00
* No. 42, 2 x 1⅝ inches, for 1-inch Wood, three Tumblers, two Keys	9.60
* No. 43, 2 x 1⅝ inches, for 1¼-inch Wood, three Tumblers, two Keys	10.80
No. 45, 2¼ x 1⅝ inches, for ⅞-inch Wood, three Tumblers, two Keys	9.60
* No. 46, 2¼ x 1⅝ inches, for 1-inch Wood, three Tumblers, two Keys	10.20
* No. 47, 2¼ x 1⅝ inches, for 1¼-inch Wood, three Tumblers, two Keys	11.40

Finely Finished, All Brass, Steel Hooks, 100 Changes. * Not kept in stock, but furnished to order. Packed one-half dozen in box.

The following Mortise Store Door Dead Locks and Night Latches are subject to a discount of 30 per cent :

Mortise Store Door Dead Lock.

	Per doz.
No. 352, 3¼ x 2¾ inches, Heavy Bronze Front, Striker and Bolt, Ornamental Bronze Escutcheon, four Tumblers, three Flat German Silver Keys	$36.00

Adjustable to Right or Left Hand Doors. Packed singly in box, complete with Screws.

Mortise Night Latch.

	Per doz.
No. 306, 2¼ x 3 inches, Bronze Front, Striker, Bolt, Knob and Escutcheon, four Tumblers, three Flat Steel Keys	$34.00
No. 307, 2¼ x 3 inches, Bronze Front, Striker, Bolt, Plated Knob and Escutcheon, four Tumblers, three Flat Steel Keys	39.00
No. 308, 2¼ x 3 inches, Plated Front, Striker, Bolt, Plated Knob and Escutcheon, four Tumblers, three Flat Steel Keys	44.00
No. 309, same as No. 306, with Rabbeted Front	40.00
No. 310, same as No. 307, with Rabbeted Front	45.00
No. 311, same as No. 308, with Rabbeted Front	50.00

Adjustable to Right or Left Hand Doors. Plain or Reverse Bevel. These Latches have four closely-racked Tumblers. Packed singly in box, complete with Screws.

This line of goods is also added :

Heavy Cast Bronze Burial Vault or Store-Door Dead Lock.

	Each.
No. 1500, 6¼ x 4 inches, weight 5⅛ pounds, three Tumblers, with Knob to operate Bolt from inside	$18.00
No. 1501, 6¼ x 4 inches, weight 5¼ pounds, three Tumblers, without Knob	15.00

These Locks are extra heavy, safe and durable, and are positively the best Locks ever offered for this purpose.

We understand that Mr. Deitz will have an exhibit of his goods at the St. Louis Exposition, which opens September 9.

WHAT THE TRADE SAY.

The disposition of retailers to press their goods and cut prices is referred to in the following letter, which comes from Philadelphia. Our correspondent, in calling attention to the practice in question, touches upon a growing tendency to a competition among Hardware dealers which threatens to result in materially diminished profits :

I would like to have your opinion of the sending out of catalogues by the retail Hardware men to the carpenters. Do you think it is a good plan? Almost all the large stores in this city do it, but I cannot see any use in it, because one store can sell their goods as low as another, and when the builders want any Hardware they are going to go to the place where they deal. I think it educates the carpenters too much. There are a good many things they make as leaders, such as Nails at $2.15; Sash Weights at 1½ cents; Shutter Straps, complete, 38 cents. The carpenters bring the books to my store and I have to meet those prices or they will go elsewhere. HARDWARE.

ITEMS.

The A. F. Pike Mfg. Co., of Pike Station, N. H., have bought out the Syracuse Oil Stone Company, of Phœnix, N. Y., manufacturers of Washita and Arkansas Oil-Stones.

Charles Morrill, manufacturer of Morrill's Saw Sets and Bench Stops, 64 College Place, New York, in announcing the death of Asa Farr, his sole agent, informs the trade that the business will be continued at the above place until the interest of the deceased has been settled, so that orders for these goods may be sent there until further notice.

Keith, Benham & Dezendorf, of Wabash and Washington streets, Chicago, Ill., send out a 23-page catalogue under date August 1, 1885. The matter consists of lists and illustrations of Tin Plates, Sheet Iron, Copper, &c. ; Stove Boards, Elbows, Coal Hods, Stove Shovels, Fire Irons, Hand Corn Shellers, Scoops, Hay Knives, Corn Cutters, Apple Parers, Axes, Post-Hole Diggers, Wire Nails and Brads, &c.

Joseph C. Grubb & Co., 712 Market street, Philadelphia, Pa., issue a 135-page catalogue containing a full line of Guns and Sporting Goods.

Berger Brothers, manufacturers of Tinners' Hardware, 223 Arch street, Philadelphia, issue a sheet illustrating their Adjustable Eave Trough Irons, and calling attention to some of their advantages. They are described as made in several different styles to suit the different modes of finishing the eaves : Nos. 7, 8, 9, 13 to drive; No. 11 to nail on rafter; No. 12 to nail under shingles or slate; No. 10 to screw or nail on square cornice; No. 6 for O. G. molding. They can be adjusted to any fall of trough desired, as the three holes in the circle are so arranged that, when one is even with those in the shank for the bolt, the next is part way over another, thus giving a uniform fall in the trough. They also call attention to their Adjustable Conductor Fastener, Plain Trough Irons, Eave Trough Spikes, Repair Spikes, Hinged Conductor Hooks, Conductor Hooks for Brick, Conductor Hooks for Wood, Long Eave Gutter, Galvanized Iron Gutter, Conductor Cleats, Flashing Hooks, &c.

The Essex Horse Nail Company, Essex, Essex County, N. Y., advise us that they have appointed T. P. Burke & Co., 100 Chambers street, New York, their special agents, under salary, for sale of their Horse Nails, and that they will be prepared to name the best prices on application.

Announcement is made that the Franz Krein Mfg. Co. and Chas. E. Nixdorff, St. Louis, have consolidated their business under the name of Nixdorff-Krein Mfg. Co. With largely increased capital and facilities they hope to merit an increased patronage from their friends and customers.

The Russell & Erwin Mfg. Co. received 11 first-class awards at the recent New Orleans Exposition on the following classification of their goods : Best collective exhibit of Builders' Hardware, Door Furniture, Window Furniture, Wood Screws, Wire Nails, Bronze and Iron Door Locks and Latches, Wrought Iron Padlocks, Brass and Iron work for Builders' Hardware, Fire Irons and Stands, Bells, Bell Levers and Bell Pulls, and Steel Squares. The Douglass Mfg. Co. received first-class award for carpenters' Edge Tools.

FROM AUSTRALIA.

The following extract from a letter of John Macintosh, Sydney, which appeared in a recent issue of the London *Ironmonger*, touches on the quality of Tools and on business methods in Hardware :

In my previous letter an admission was made to the effect that many changes and improvements had taken place during my long experience in the very many items that constitute the stock in trade of a general ironmonger. By such admission I did not desire to infer that the quality and tempering of Tools in general had been improved. I have a lively recollection of some particular articles that the art of manufacturing, in my opinion, has been to a large extent lost. About 40 or 50 years back we had carpenters' and millwrights' Chisels of that exquisite quality and temper that from their reliable and useful qualities were highly prized by the best mechanics, by whom they were cared for as of more than golden value. Tools of that era are still cared for, and if any of your readers have a doubt they will find among their acquaintances a first-class mechanic who has been, say, about 50 years at his trade, and is owner of a tool chest well fitted with exquisite Tools that he had used as required since his apprenticeship. Such Tools are not now to be purchased, but there is little doubt some of your manufacturers who now use emery-wheels and japan so freely in the finish of their Edge Tools may state that they can excel. The men whose names I have in mind, and other worthy names in their special branch of manufacture, are the men who originated the world-wide fame of British manufactures. Such men would not and did not stoop to reduce the quality of their manufactures to suit the views of any persons. They in early life did not enter an office to acquire the requisite knowledge to become manufacturers; they most probably acquired the knowledge in the workshop among their fellows, by manual labor, and, with a personal pride in their excellence of skill, always exercising a zealous and jealous care that their manufactures were perfect in all their parts prior to being sold. Some of your correspondents are of opinion that factors, merchants and middlemen could be well dispensed with, and that the manufacturer should deal direct with the distant shopkeeper. Such procedure, in my opinion, would be impracticable except in leaking lines, such as Iron, Lead, Wire Nails, &c. I have dealt with one firm of merchants in England for the past 35 years, and have found their services eminently beneficial to my interests, and not one single line of discord has passed between us during these years. My firm carries what may be termed a large stock of Hardware, &c., and, were it not that I do not desire to use your columns as an advertisement, I would enumerate a few lines to show its extent. However, I may state that it stands about the fifth in rank and in value in New South Wales. We will say that A, B, C, D and E are large first-class manufacturers of General Hardware, but my customers who support me are various in their tastes, necessitating me to keep articles of each manufacturer in stock. To do so, small and frequent orders must be given each, which, on being collected, may fill a package. So with the 10,000-and-odd items comprising an ironmonger's large stock in the colonies, which has to be collected in small quantities from manufacturers located over Great Britain and from some cities on the Continent. We also find that merchants and factors have a keener and more general knowledge of their business than manufacturers, and are less prejudiced in their opinions. In the scale of utility and usefulness I am of the opinion that a merchant or factor ranks quite as high as a manufacturer, and it would be highly inconvenient to us colonists to be without their valuable services, and frequently their kindly accommodation.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, August 24, 1885.

Reports come in from all sections of the South of a continued activity in all kinds of business, and nothing has yet occurred to mar the prospects of large crops. Some estimates have been made that the cotton crop will exceed 8,000,000 bales, and few are found who place the amount at much less than that figure; but, be that as it may, unless some catastrophe overtakes the staple it will exceed by far all former yields. We hear of a number of new railroads projected besides those actually commenced, some of which will probably be undertaken and completed. Many narrow-gauge and street lines in the cities are being brought out by parties who have the ability to complete them. There is at the present time a large inquiry and demand for Light Steel Rails through the South, and to such an extent that some of the manufacturers have withdrawn quotations and will only make prices on application, to be accepted at once. Some of the Southern banks have within the last two or three weeks considerably increased their capital, and some new banking concerns have been established, but these so far will be but a drop in the bucket toward supplying the actual needs. A boom seems to have struck our particular locality in the way of new buildings, and reports say that many other towns located in the manufacturing districts of the South are not behind in this particular. Within the last two weeks there has been contracted for, including those that were under previous contract, not less than $500,000 in value of new buildings, and contracts for new buildings are of every-day occurrence. All of our manufacturers at the present time are simply crowded with work, and some are increasing their capital and capacity. The Chattanooga Plow Company, in addition to their regular make of Plows, for which they have a large demand, have had orders for Sugar Mills and Evaporators much more than their ability to fill.

Pig Iron.—Among the furnaces we have to note a very encouraging feeling; not that prices have actually advanced, but contracts are not so easily made as formerly, and hardly a furnace owner but what expects a stiffening up in prices. Certain it is that large blocks of Iron in stock have gone forward and are now in the hands of consumers or speculators. A number of the furnaces in the Southern district have lately improved the quality of their output by crushing their Ore and Lime. This they do by means of what is known as the Gates' Crusher, a machine made in Chicago, which has a capacity of several hundred tons per day. The furnaces are working better, more regular and with an increased percentage from these Ores.

Hardware.—The demand for this line of trade has increased very much of late, and may now be said to be brisk. Building material of all kinds are in large demand, and in the articles of Sash, Doors and Blinds the manufactures have all they can do to fill the orders from the Hardware stores. Nails are moving briskly, and some difficulty is experienced in getting supplies. The demand for Bar Iron is good, and selling at $1.50 rate on carload lots from the mills, and an advance of 10¢ @ 25¢ from stores.

Railroad Fastenings—Are in good demand, and the works are running night and day. Fish Plates are quoted at $1.55 in large lots, and Spikes at $1.75.

Lumber—Is getting to be a standing commodity in this market now. Sales during the past week have been a little over 500,000 feet of Poplar at $20 ₱ 1000, mostly for the Northern and Eastern markets. Both Black Walnut and Cherry are in good demand, and sales within the last few days are about 100,000 feet, at prices ranging from $55 to $65 ₱ 1000.

Birmingham.

BIRMINGHAM, Ala., August 24, 1885.

Faith in the coming boom is still about the most prominent characteristic of every branch of the Iron trade in this district. In hardly any line has there been in the last week any conspicuous practical manifestation of the healthy influences at work, but everywhere confidence in their existence and early efficacy has steadily strengthened.

Pig Iron.—The furnaces do not report any better prices than they have been getting, but all of them seem to be getting further away from the attitude they occupied until recently of almost begging for business. The new contracts that they have at

old prices were closed with certainly not less avidity on the buyers' than on the sellers' part. Sufficient business is doing, too, to reduce almost every day the very small accumulation of Iron, until, except in "off" grades, no considerable stocks of Coke Iron are to be found in Alabama. Then the tendency of the trade is such as to promise rather a strengthening than a loosening of Birmingham's hold upon the new markets in its very extensive territory. An important guarantee of permanent business in a big field has just been secured. Notoriously, the continuation of the shipments of Pig Iron from here to the East has rested with the railroads; so, naturally, no little solicitude has been felt for the present low freight rates, and the roads a few days ago were induced to make the rates a certainty until the first of next May. The manufacturers now do not seem to apprehend a rise, even after the expiration of this guarantee, except in reasonable proportion to an advance in the prices of Iron.

Ore.—An opening has been made on a valuable Soft Red Ore property a few miles from here up the Alabama Great Southern Railroad, and figures are already under advisement for some big contracts for the Ore, a Tennessee furnace or two being among the largest promised buyers. The trade is contingent mainly upon the railroad's laying a track to the mine, which is some 2 miles distant. Even Mississippi, it seems, aspires to do something in the Ore line. The Queen and Crescent Railroad has on exhibition at its New Orleans offices some specimens of Ore found in that State near one of the company's lines.

Manufactured Iron.—The Birmingham Rolling Mills are pressed more and more to keep up with their orders. Their Plate and Sheet business is especially creditable, and seems to vindicate the wisdom of a recent refusal of an offer from a St. Louis house to take the mills' whole product in this line. The company, by shipping the Iron themselves, are getting the full benefit of the reputation it is earning.

Cast Pipe.—In this line something has been doing in the last few days, for the first time in months. The market has come to the prices demanded by the manufacturer here (the Birmingham Iron Works), and heretofore considered too high by buyers. A sale was made last Thursday, which suggests from $26 to $30 a ton as fair quotations for from 8 to 3 inch Pipe, and specifications for bids on some big orders are in hand. On these the quotations given above would be deemed somewhat high.

Coal.—The Coal business has run down rapidly, most of the operators, it seems, having worked unnecessarily fast and got unnecessarily ahead of their contracts earlier in the summer. Even with idleness forced on two of the Warrior companies by their strike, there is only one concern in this county digging as much Coal as it can. For instance, the Pratt Company, the largest operators, are mining only about 1250 tons a day, or half of their capacity.

Lumber.—One of the livest things hereabouts, though one of the flattest as to prices, is the Lumber business. A number of small mills have commenced to unload lately and have helped to run down the prices of their stuff, Run-of-log Pine, delivered here, to $7.50 ₽ 1000. Builders buy the best Pine Siding at $14; Flooring at $16, and Kiln-dried Finishing Lumber, at $16 for Single and $18 for Double Surfaced. The mills, though, all report the demand considerably improved of late. Several in Middle Alabama have been shipping to the far West and Northwest for some time, and one concern is now selling in 12 States, not counting Alabama.

St. Louis.

ST. LOUIS, MO., August 24, 1885.

During the past week there has been an increase in the operations of manufacturers and continued activity with jobbers. The inquiry of the Missouri Pacific Railroad for bids on 600 cars is considered substantial evidence of the increase in the Southwestern trade. The most noteworthy occurrence of the week was the reorganization of the bondholders of the Belcher Sugar Refinery, under the name of the St. Louis Sugar Refining Company. The capital stock of $750,000 will be increased to $1,250.000, or more if found necessary. The Clearing House shows an increase of $1,200,000 over last week.

Hardware.—No changes of any importance have occurred in prices, and the improvement in demand continues.

Nails.—Even the representatives of the Eastern mills are now complaining of broken lines and scant stock at this point; and the Iron Nails are not in much better supply, delays in obtaining requirements being an almost common complaint. In consequence of demand the Western Nail Company began operations on the 19th inst., but with only six men in charge of machines. How far the company will be successful in increasing the number will probably depend upon their action in defending the men and the means to which the nailers and feeders will resort. The vice-president of the United Nailers of Wheeling has effected the formation of a branch lodge of the United Feeders of America, and on the 22d there were 76 members.

Lead.—An advance was made during the week and prices are strong at $4.20 for the refined. $4.15 for the common. The bulk of the receipts have been reshipped and the ocal sales are light.

Merchant Iron.—There is no change in prices, although a better demand.

Wire.—What little Wire for barbing was in store has been exhausted and factories are now relying upon shipments from Eastern mills, as the product of the local mill is almost entirely engaged by factories connected with it. The Harrison Mill is not being operated, and, as it was formerly advertised as having a daily capacity of 100 tons, its being out of the market and the shut-down at Cleveland have had a decided influence on the local market. The advance on Fencing Wire has been considerably more than the advance on Wire Rods, and prices for immediate shipments, best quality, are nearly $2.75 for Annealed and Bright Wire.

Spelter.—Is still neglected and the market continues in an unsatisfactory state.

Barbed Wire.—Work is steadily increasing at the factories, some running overtime on day turn. Prices are affected by advance on Plain Wire, and Painted Cattle Wire, in round lots, is firm at 3¢ net for the Uniconsed.

W. H. SHIELDS, 305 Olive street, St. Louis, reports as follows, under date of August 24, 1885: While prices for standard brands of Pig Iron show no decline, the general demand is not good. Ohio Irons of strange brands are offering at ruinously low figures, probably to gain a standing. Some undesirable grades of Southern Iron have been unloaded on outsiders desiring to speculate, upon which the purchasers could not now realize within $3 of the price paid. Upon the whole, the condition of the market remains practically unchanged. Quotations:

CHARCOAL FOUNDRY.	
Missouri	$14.00 @ $16.50
Southern	17.00 @ 18.50
COAL AND COKE FOUNDRY.	
Missouri	14.00 @ 16.00
Southern	15.00 @ 17.00
American Scotch	16.00 @ 19.00
MILL IRON.	
Missouri	14.00 @ 14.50
Southern	13.00 @ 14.00
CAR-WHEEL AND MALLEABLE.	
Southern	20.00 @ 24.00
Lake Superior	20.00 @ 23.00
Old Car Wheels	14.00 @ 15.00
Old Rails	15.00 @ 17.00
Connellsville Coke (East St. Louis)	5.30 @ ....

Cincinnati.

AUGUST 24, 1885.—*Pig Iron.*—The condition of the market remains about as last reported. No indications of any change in the production, consumption or prices. Quotations for the past week:

CHARCOAL FOUNDRY.	
Hanging Rock, No. 1, 4 mos	$19.00 @ $21.00
Hanging Rock, No. 2, 4 mos	18.00 @ 19.00
Southern No. 1, cash	17.00 @ 17.50
Southern No. 2, cash	15.00 @ 16.50
COKE FOUNDRY.	
Ohio and West Pennsylvania, No. 1, 4 mos	16.00 @ 18.50
Ohio and West Pennsylvania, No. 2, 4 mos	15.00 @ 17.50
Southern No. 1, cash	16.50 @ 17.00
Southern No. 2, cash	15.00 @ 15.50
SILVER-GRAY SOFTENERS.	
Hanging Rock (Jackson County), No. 1, 4 mos	.... @ 17.00
Hanging Rock (Jackson County), No. 2, 4 mos	.... @ 16.00
Hanging Rock (Jackson County), No. 3, 4 mos	.... @ 15.00
Other makes, different grades	14.00 @ 15.50
FORGE.	
Western and Southern Coke and Stonecoal	13.00 @ 15.00
Western and Southern Charcoal	15.00 @ 17.00
CAR WHEEL.	
Hanging Rock, Cold-Blast Charcoal, 4 mos	21.00 @ 26.00
Hanging Rock, Warm-Blast, 4 mos	19.00 @ 20.00
Southern Standard Warm-Blast, 4 mos	23.00 @ 25.00
Southern Common Warm-Blast, cash	16.00 @ 17.50
SCRAP.	
Rails	17.50 @ 18.00
Wheels	15.00 @ 16.00

No report of sales of Ordinary Wrought or Cast. Above quotations on Pig Iron are f.o.b. Cincinnati. When shipped from furnace the price will be less the freight to Cincinnati; a discount of 50¢ ₽ ton will be made from four months' prices for cash.

Louisville.

W. B. BELKNAP & Co., Louisville, under date of August 24, 1885, report as follows: The general market for the past week has manifested an increased activity which is gratifying to report. There is a good demand for all lines of goods except those that are notably out of season and such as are controlled by combinations. This demand has come not from any one locality, but is well distributed, and, while the orders are not speculative, they are frequent and large enough to warrant the belief that we have passed the dullest days and are entering upon brighter ones. The railroad interests hereabout are improving daily; receipts are large and rates well maintained; the tobacco alone entering and issuing from this market is enough to give it the air of prosperity, even if the movement in other products were small. *Bar Iron.*—This sluggish commodity has at last awakened in response to the good demand, and the metallic ring of Bars and Bales may be heard in the warehouses and at the shops and on our principal thoroughfares constantly. Prices are still low, but this must be either because the movement has just begun or that it has created such a novel sensation that one hardly knows how to act upon it. *Hoops* are quiet; as this not the distilling season, the demand for cooperage is light. *Sheet* is strong, both in Heavy and Light Gauges. The demand for Heavy Gauges indicates a good demand of construction, and confirms the reports that we hear in other ways. Light Sheet is positively scarce, and another advance of $1 @ $2 ₽ ton may be fairly claimed. Some of the concerns which generally contract early in the season for large supplies postponed it so late this year that they have now become anxious buyers and are glad to secure Nos. 26 and 27 at the higher prices. *Steel.*—Cast Steel is selling in fair quantities. Agricultural Steels are in request, some large contracts having been placed at figures not far from last year's, although it was thought early in the season that they would be much lower. *Nails.*—The demand for Nails has been more active than at any time since the January boom. Trade on these has come "all in a heap." It is not at all surprising that dealers and others should awaken to the realization of the fact that the long cessation of work by the mills must create a scarcity. The only surprise is that the prices did not respond to the situation more promptly. Iron Nails, that were absurdly low, have been put up by the manufacturers. Steel Nails are especially scarce and commanding full price. *Wire.*—The fall trade on Barb Wire is apparently setting in in full power, and it promises to be lively. There is a great deal of fencing to be done throughout this territory this coming season, and farmers are only just beginning to prepare for it. Prices have stiffened from $1 to $2 ₽ ton, and if Plain Wire has made the advance claimed for it by some of those best posted, viz., $3 ₽ ton, we shall see a still stiffer price made in the Barb Wire to correspond. *Metals.*—Pig Lead and Bar Lead are selling in a moderate way at advanced prices. Babbitt Metal and Solder are jobbing about as usual, irrespective of the advance. Fine crops throughout the South are doing much to stimulate business. A great number of buildings are being put up in our city, and the exposition, now in full blast, is attracting visitors. Altogether both city and country are putting on signs of prosperity, and ere long the patient, long-suffering Hardware and Iron men may hope to share it.

GEORGE H. HULL & Co., of Louisville, report to us as follows, under date of August 24, 1885: The improved feeling noted last week still continues, and, although no very large sales have been reported, the volume of moderate-sized sales is very satisfactory. Prices are also held firmer. Some grades on which low prices had been put to clear out accumulations have advanced, and are now held at full market prices. We quote for cash, in round lots, as below:

PIG IRON.	
Southern Coke, No. 1 Foundry	$16.00 @ $17.00
" No. 2 "	15.00 @ 15.75
" No. 2½ "	13.50 @ 14.25
Hanging Rock Coke, No. 1 Foundry	15.50 @ 16.00
Hanging Rock Charcoal, No. 1 Foundry	20.00 @ 21.00
Southern Charcoal, No. 1 Foundry	17.50 @ 18.50
Silver Gray, different grades	14.00 @ 15.00
Southern Coke, No. 1 Mill, Neutral	13.00 @ 13.50
" " No. 2 " "	12.50 @ 13.00
" " No. 1 " Cold Short	12.75 @ 13.00
Southern Charcoal, No. 1 Mill	16.00 @ 17.00
White and Mottled, different grades	11.00 @ 12.00
Southern Car-Wheel, standard brands	23.00 @ 24.00
Southern Car-Wheel, other brands	18.00 @ 20.00
Hanging Rock, Cold-blast	23.00 @ 24.00
" Warm-blast	18.00 @ 20.00

There is some inquiry for Scrap, but the market still continues dull, and the prices low. We quote for cash, in round lots, for Old Material as below:

Rails, ₽ ton	$16.00 @ $16.50
Wheels, ₽ ton	13.00 @ 14.00
No. 1 Wrought, ₽ 100	.70 @ .75
Country Wrought, ₽ 100	.50 @ .60
No. 1 Cast, ₽ 100	.50 @ .55
Boilers, cut, ₽ 100	.60 @ .65
Boilers, uncut, ₽ 100	.40 @ .50
Axles, ₽ 100	.90 @ .95
Flues, Tanks and Sheets, ₽ 100	.30 @ ....
Burned Scrap, ₽ 100	.20 @ .30

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of August 24, 1885, as follows: The usual number of small orders have been received, and a few large sales of 500 to 1000 tons, both of Charcoal and Southern Irons, have been made at ruling prices. More than the usual number of inquiries have been received, and there seems to be a feeling among buyers that at last the bottom has been reached, and they are willing to contract for future delivery at present prices. While this is the case with the majority, a few still insist on buying only for present needs. Some furnaces have refused to contract for delivery after January 1 at present prices, as they are confident of better prices after that time. There seems to be a better feeling than for some time past, and prices seem likely to advance. For immediate shipment and for round lots prices on four months' basis are:

Lake Superior Charcoal, Nos. 1, 2 and 3	$19.25 @ $19.75
Lake Superior Charcoal, Nos. 4, 5 and 6	20.00 @ 21.00
Lake Superior Coke, All Ore	18.25 @ 18.75
Lake Superior Coke, Cinder Mixed	16.75 @ 17.00
Standard Ohio Blackband	18.50 @ 19.00
Southern No. 2	16.75 @ 17.00
Southern Silvery, Open	16.50 @ ....
Southern Silvery, Close	16.00 @ ....
Jackson Co. (Ohio) Silvery	18.00 @ 18.25
No. 1 Southern Mill	14.00 @ 14.50
Old American Rails, Iron	17.50 @ 18.50
Old Wheels	14.00 @ 15.00

Baltimore.

R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, No. 21 South Frederick street, write as follows, under date of August 24, 1885: The Iron market remains dull and quiet, and we quote prices about as follows:

Baltimore Charcoal Wheel Iron (all Baltimore Ore)	$28.00 @ 29.00
Virginia Cold-Blast Car Wheel Iron	28.00 @ 29.00
Anthracite, No. 1	18.00 @ 19.00
" No. 2	16.00 @ 18.00
" No. 3	14.00 @ 16.00
" Mottled and White	13.00 @ 14.00

Imports and Exports.

IMPORTS.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Aug. 26, 1885:

Hardware.

Boker Hermann & Co. Hdw., cutlery and guns, pkgs., 68
Chief of Ordnance, Mdse., cs., 3
Curley J. & Bro Cases, 2
Drexel, Morgan & Co. Arms, cs., 37
Frasse Peter, Mdse., cs., 3
Guerney F. B. Packages, 2
Graef Cutlery Co. Cutlery, cs., 8
Graef Bros. Cases, 2
Hartley & Graham, Mdse, cs., 10 Guns, cs., 12
Harris & Nixon, Packages, 7
Kastor A. Case, 1
Koeller & Schmitz, Cutlery, cs., 2
Kayser Julius & Co. Machinery, cs., 3
Lamarche H. & Sons, Mdse., cs., 9
Schoverling, Daly & Gales, Mdse., cs., 30 Cases, 10
Shillito W. Case, 1
Union Line, Mach'y, cs., 2
Ward Asline, Cutlery, cs., 2
Wiebusch, Hilger, & Co Cutlery and hdw., pkgs., 91 Chains, cs., 16
Witte John G. & Bro. Guns, cs., 4 Needles, case, 1
Order, Cases, 12 Mach'y, case, 1 Mach'y, pkgs., 2 Labels, cks., 2

Iron.

Am. C. & Dredging Co. Anchor, 1 Shackles, 2
Baring Bros. & Co. Ore, tons, 280 Wire rods, coils, 73 Bars, 13,677
Brown Bros. & Co. Ore, kg., 580,000 Bundles, 2473
Bureau of Ordnance, Drum cable, 1
Crocker Bros. Spiegeleisen, tons, 596½ Pig, tons, 200
Eckstein C. G. & Co. Girders, 40
Echeverria M. Old metal and bolts, Pounds, 1800
Monjo, Jr., Louis, Old wheels, 361 Old frogs, pcs., 12
Morton, Bliss & Co. Beams, 515
Navy Department, Forgings, 2
Naylor & Co. Cotton ties, bdls., 8800 Rods, coils, 15,764
Pim, Forwood & Co. Galv. sheets, bdls, 30 Case, 1
Stetson Geo. W. Pig, tons, 100
Wood, Niebuhr & Co. Rods, cs., 197
Order, Spiegeleisen, tons, 350 Fish plates, bdls, 140 Bolts, case, 1 Beams, 624 Rods, bdls., 3980 Wire rods, bdls., 199 Railway wheels, 18 Rods, pkgs., 553 Fence wire rods, coils, 20,340

Steel.

Cary & Moen, Bundles, 358
Eddy & Co. Cases, 2
Naylor & Co. Rods, bdls., 14,205
Power C. W. Cases, 5
Sellers W. B. Case, 1
Wagner, W. F. Bundles, 196 Bars, 14 Cases, 8 Plates, 15
Order, Rails, 1834 Bands, 146 Bundles, 309 Casks, 26

Metals.

Alexandre F. & Sons, Shot, casks, 12 Shot, cs., 2
Baring Bros. Tin plates, bxs., 356
Beste Henry, Old type metal, bxs., 9
Burt Geo. A. Old brass gun, 1
Drexel, Morgan & Co. Tin plates, bxs., 217
De Milt H. R. & Co. Tin plates, bxs., 600
Field, Alfred & Co., Per. caps, cs., 5
Grubb J. C. & Co. Per. caps. cs., 8
Naylor & Co. Tin plates, bxs., 1750 Tin slabs, 2191
Phelps, Dodge & Co. Tin plates, boxes, 17,985
Shepard Sidney & Co. Tin Plates, bxs., 907
Warren J. M. & Co. Tin plates, bxs., 540
Wilson's Sons, John, Zinc, cs., 10
Witteman Bros. Metal caps, cs., 23
Zinsser W. & Co. Lead capsules, cs., 17
Order, Tin plates, bxs., 2067 Antimony, cks, 75 Tin slabs, 982 Tin ingots, 2987 Spelter, plates, 2007 Sheathing, cs., 105

The imports of Cutlery, Hardware and Metals for the week ended August 21, were as follows:

	Quantity.	Value.
Aluminum	1	$1,461
Anvils	6	118
Brass goods	30	2,161
Bismuth	4	2,015
Bronzes	22	3,259
Chains and anchors	46	2,100
Clocks	75	7,248
Copper	....	165
Cutlery	160	42,781
Guns	177	22,151
Hardware	7	383
Iron, pig, tons	1,301	26,389
Iron, sheet, tons	23	1,744
Iron ore, tons	1,638	2,995
Iron tubes	50	52
Iron cotton ties	22,001	14,868
Iron, other, tons	992	47,664
Machinery	57	4,900
Metal goods	376	57,974
Nails	7	716
Needles	23	6,900
Nickel	9	5,098
Old metal	....	291
Oxide of zinc	200	1,891
Plated ware	18	1,328
Percussion caps	37	5,847
Pins	16	1,990
Quicksilver	150	3,894
Regulus antimony	40	2,085
Saddlery	11	1,395
Spelter	112,000	3,241
Steel	147,282	128,107
Tin, boxes	37,083	142,878
Tin, 7,961 slabs; ₽	720,596	144,700
Wire	578	3,769

The comparison for two years since January 1 is as follows:

	34 weeks of 1885.	Same time 1884.
Cutlery, pkgs	2,806	3,399
Hardware, pkgs	417	513
Iron, R. R., bars	....	9,422
Lead, pigs	33,314	25,261
Steel, pkgs	1,446,588	1,246,250
Tin, bxs	1,259,799	1,2.4,974
Tin slabs, ₽	12,326,398	13,217,187

EXPORTS.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the Port of New York, for the week ending August 25, 1885:

	Quan.	Val.
Dutch West Indies.		
Hdw., pkgs	7	$55
Nails, kegs	11	46
Boiler tubes	75	200
Danish West Indies.		
Ag.imp., pkgs	17	60
Hdw., cs	4	30
Pumps, pkge.	1	28
Nails, kegs	10	48
Copenhagen.		
Hdw., cs	21	575
Mf. iron, pkgs	17	675
Clocks, case	1	50
Pumps, pkgs	7	146
Christiania.		
Hdw., case	1	50
S. rollers, cs	25	567
Bremen.		
Cutlery, case	1	200
Ag. imp., pkgs	4	185
Mf. iron, pkgs	65	2,067
Hdw., cs	14	747
Firearms, cs	2	380
Sew. ma., cs	12	270
Gottenburg.		
Mach'y, pkge	1	675
Rotterdam.		
Mf. iron, pkgs	12	75
Hdw., pkgs	12	174
Hamburg.		
Ag.imp., pkgs	13	540
Clocks, pkgs	76	2,290
Sew. ma., cs	520	13,406
Rifles, case	1	132
Hdw., pkgs	109	3,174
Mach'y, pkgs	25	2,837
Copper matte, bags	1610	11,000
Nails, cs	2	47
Copper, pkgs	68	5,250
Steam pumps, pkgs	8	2,100
Copper, cakes	18	229
Guns, case	1	90
Saws, case	1	93
Mf. iron, pkgs	6	165
Liverpool.		
Hdw., pks	55	763
Saws, cs	24	47
Clocks, pkgs	319	7,036
Cutlery, case	1	48
Guns, cs	3	481
Eyelets, cks	10	910
Iron roll, bxs	40	940
Copper matte, bags	6060	33,000
Copper matte, cks	346	7,560
Scales, cs	35	773
Pumps, pkgs	18	906
Santander.		
Mf. iron, pkgs	20	98
British West Indies.		
Nails, kegs	59	156
Sew. ma., cs	20	291
Mach'y, pkge	1	117
Mf. iron, pkgs	3	24
Needles, case	1	125
Tinware, cs	4	308
Cider mill	1	27
Hdw., pkgs	42	388
Clocks, cs	3	58
British Australia.		
Hdw., pkgs	558	8,954
Nails, cs	36	498
Cutlery, cs	10	95
Iron safes	6	550
Wringers, cs	2	73
Sew. ma., cs	87	1,100
Clocks, cs	91	2,230
W'd mills, pgs	64	2,714
Cartridges, case	1	18
Mf. iron, pkgs	190	1,837
Ag.imp., pkgs.	72	1,330
Pumps, pkgs.	19	916
Firearms, cs	4	424
Tacks, cs	16	143
Saws, case	1	100
Mach'y, pkgs.	2	80
Barcelona.		
Sew. ma., case	1	20
Screws, cs	4	20
Porto Rico.		
Mf. wire, case	1	25
Nails, pkgs	6	90
Hdw., cs	18	105
Palermo.		
Hdw., case	1	45
Cuba.		
Pumps, pkgs.	5	155
Nails, cs	10	82
Mf. iron, pkgs.	824	1,687
Hdw., pkgs	88	1,710
Spikes, kegs	6	23
Iron safes	2	82
Tinware, cs	19	284
Mach'y, pkgs.	12	1,775
B. cabs, pkgs.	4	151
Scales, cs	43	559
Ag. imp., pkgs	14	808
Cartridges, cs	3	76
Tacks, cs	12	225
Nails, kegs	50	143
Tinfoil, case	1	41
Boiler	1	338
Cutlery, cs	51	730
Mach'y, pkge.	1	25
Rivets, kegs	25	75
Havre.		
Tinware, cs	2	3
Copper, cks	135	18,300
San Domingo.		
Mf. iron, pkgs	9	182
Iron, pkgs	12	70
Cutlery, cs	3	69
Iron safe	1	63
Hdw., pkgs	13	261
Nails, kegs	107	302
Mach'y, pkgs.	7	154
Saw, case	1	58
Clocks, case	1	16
Brazil.		
Rifles, cs	5	317
Scales, cs	85	3,074
Clocks, pkgs.	92	2,917
Hdw., pkgs	374	4,814
Sew. ma., cs	122	2,550
Locomotive	1	8,283
Railroad cars	32	23,200
Nails, kegs	207	480
Cutlery, cs	169	2,031
Graniteware, cs	59	1,950
Windmill	1	819
Cartridges, cs.	17	299
Pumps, pkgs.	20	735
Tacks, bxs	189	1,789
Mf. iron, pkgs	553	4,757
Ag.imp., pkgs	186	1,949
Wheels and a., pairs	207	3,681
Mach'y, pkgs.	83	6,086
Car trucks, pairs	5	1,700
B. goods, case	1	42
Agateware, cs	8	280
Spikes, kegs	20	36
Steel springs, bxs	2	112
Hayti.		
Nails, kegs	5	12
Sewing mach.	1	15
Ag. imp., cse	1	10
Mexico.		
Cutlery, cs	14	184
Hdw., pkgs	23	846
Sew. ma., cs	25	556
Clocks, case	1	20
Scales, cs	32	385
Hab. metal, case	1	58
Firearms, cs	2	300
Bucklery, cs	2	49
Mf. iron, pkgs	439	2,545
Pumps pkgs.	15	816
Nails, kegs	25	60
Nails, cs	2	37
Cartridges, cs	15	322
Mach'y, pkgs.	137	6,015
Blower	1	51
Tinware, cs	3	80
Ag. imp., pkgs.	8	164
A. broke matl., case	1	45
Venezuela.		
Fountains	2	66
Mach'y, pkgs.	95	12,602
Iron, bars	70	61
Fire fronts	2	174
Steel rails	700	2,400
Clocks, cs	2	139
Ag. imp., pkge	1	31
Sugar mills	2	315
Tacks, case	1	15
Mf. iron, pkgs	416	3,834
Pumps, pkgs.	7	188
Cutlery, cs	10	179
Scales, cs	9	174
Sew. ma., cs	30	567
Wheels and axles	54	961
Spikes, kegs	30	80
Hdw., pkgs	33	516
W'h'barrows, pkgs	8	59
Iron safe	1	50
Tinware, cs	5	82
Argentine Republic.		
Mf. iron, pkgs	9	180
Nails, pkgs	98	1,425
Tacks, cs	55	425
Washing ma., pkgs	13	141
Cutlery, cs	21	250
Hdw., cs	82	1,774
Ag. imp., pkgs	706	24,886
Clocks, cs	68	1,027
W. mills, cs	45	1,089
Sew. ma., cs	257	5,045
Mach'y, pkgs.	8	607
United States of Columbia.		
Sew. ma., cs	116	2,563
Cutlery, cs	21	612
Scales, cs	13	124
Print. presses	2	498
Scabbard, case	1	72
Steel, cs	7	140
Chains, bbls	2	142
Mach'y, pkgs.	93	2,691
Hdw., pkgs	74	1,370
Mf. iron, pkgs	225	1,007
Saws, cs	4	100
Iron, tank	1	229
Cartridges, cs	5	63
Firearms, cs	3	356
Iron, pkgs	6	24
Central America.		
Hdw., cs	4	53
Tinware, cs	2	27
Cutlery, cs	2	36
Cartridges, case	1	23
Nails, kegs	15	48
Mf. iron, pkgs	21	185
Uruguay.		
Sad iron, cks	15	285
Ag. imp., pkgs	466	12,753
Hdw., pkgs	22	542
Pumps, pkgs.	9	218
Revolvers, case	1	1,314
Cutlery, cs	15	278
Sew. ma., cs	97	855
Mach'y, pkgs.	20	1,600
W. machines	12	160
Clocks, cs	28	650
Cartridges, cs	4	208
Japan.		
Hdw., cs	2	100

Coal Market.

By general verdict the Coal trade is pronounced by operators and producers to be in so bad a state that it cannot be much worse. A significant movement is the issue of their September circular by the Pennsylvania Coal Company, giving the prices of fresh mined Pittston Coal at Newburgh, as follows:

Lump, ₽ ton	$3.30	Chestnut, ₽ ton	$3.45
Grate, "	3.20	Pea, "	2.30
Egg, "	3.20	Buckwheat, "	1.90
Stove, "	3.70		

Fifty cents ₽ ton additional for delivery discharged at New York, or 35¢ ₽ ton for delivery "alongside."

The foregoing would indicate retaliatory cut rates as punishment for offenders who refuse to restrict in accordance with the official allotment, notably the Delaware, Lackawanna and Western, Samuel Sloan, president. It is understood that other companies have issued circulars to contractors making Broken and Egg $3.15, net, f.o.b. For example, the Delaware and Hudson Company have reduced their schedule price from 10¢ to 15¢ ₽ ton. The current prices of late are about $2.25 @ $2.35 for Pea, alongside; Chestnut, $3 25 @ $3.50; Stove, $3.75 @ $4, alongside. A meeting of Coal company presidents at Saratoga on Wednesday was called ostensibly to consider Western trade, though it was surmised in advance that other subjects might incidentally be touched upon. The chief point of interest just now relates to the September output. The allotment is the same as for August, 3,250,000 tons, but the question arises as to the physical practicability of handling and housing so much Coal, when the depots and sidings are in some instances already full. In the face of embarrassing questions, leading producers persist in their own way, heedless of remonstrances, and the query arises, "Is not the so-called Coal combination already a thing of the past?"

Bituminous Coal is about the same; Clearfield, say $3.25; Cumberland, $2.85.

The total amount of Anthracite mined thus far in the year 1885 is 17,035,103 tons, compared with 17,798,567 tons for the same period last year, a decrease of 763,464 tons. The total amount of Bituminous sent to the Eastern markets thus far in the year 1885 is 3,538,687 tons, compared with 3,602,457 tons for the corresponding period last year, a decrease of 63,770 tons.

The official report of the Anthracite Coal companies shows that they have mined for the first seven months of the current year a little over 600,000 tons in excess of the allotments agreed upon.

Trade Report.

New York Iron Market.

American Pig.—In some quarters a little more inquiry is reported, but generally speaking there has been no noticeable increase in transactions. It is, of course, to be expected that during the coming month the demand will be more active, as it usually is about that time. Whether any unusual amount of Pig Iron will be called for remains to be seen. As yet this market shows no indications to that effect, except that the smaller foundries are reported to be doing a little more. After so long a period of dullness the danger always will exist that the natural improvement of the fall will be magnified into an incipient boom. The Iron trade of this section shows a disposition to be very conservative, and does not countenance the efforts of those who are anxious to talk up an improvement. During the week between 2000 and 3000 tons of Gray Forge have been taken by a near-by mill at the same figures at which a similar contract was placed early in the summer. We quote standard brands of Lehigh and North River Irons, tidewater delivery, nominally as follows: No. 1 X Foundry, $17.50 @ $18.50; No. 2 X Foundry, $16 @ $16.50; Gray Forge, $15.25 @ $15.50; the outside figure is asked for special brands. Outside brands sell for 50¢ @ $1 less than our quotations.

Scotch Pig.—Arrivals have been a little more liberal. Nothing but a small business in jobbing lots is being done. Nominal quotations for 5 and 10 ton lots are as follows: Coltness, $19.50 @ $20 to arrive; Gartsherrie, $19.50 to arrive; Shotts, $19.50 @ $20 to arrive, $20 from yard; Carnbroe and Glengarnock, $18.50 @ $19 to arrive; Summerlee, $19 @ $19.50 to arrive; Dalmellington, $18.50 to arrive; Eglinton, $17.50 @ $18 to arrive; Clyde, $18.50 @ $19 to arrive. Concessions are made for larger lots and for sales from dock.

Bessemer Pig and Spiegeleisen.—Nothing of consequence has been done in Domestic or Foreign Bessemer Pig. In Spiegeleisen only a few small lots have been placed. We quote nominally: Foreign Spiegeleisen, 20 %, $25.25 @ $25.50; 10 %, $21.50; 45 %, $42; 60 %, $52, and 80 %, $70.

Bar Iron.—A better tone prevails, and it is noted particularly that some consumers who have steadily pursued a hand-to-mouth policy are in some instances beginning to stock up. The result is that in some quarters more orders have been taken in one week than in a month previously, and cases are reported in which concessions which would have been made a few weeks since were refused, without leading to the loss of the order. On the other hand, it is necessary to state that there are still sellers who are making low offers, so that the market, while less demoralized, is not quotably higher. We quote for delivery here in round lots: Common Iron, 1.45¢ @ 1.55¢; Medium, 1.55¢ @ 1.65¢, and Refined Iron, 1.7¢ @ 1.9¢. Concessions from these figures are very difficult to obtain. Store prices are 1.6¢ @ 1.75¢ for Common, 1.75¢ @ 1.8¢ for Medium and 1.85¢ @ 2¢ for Refined. Swedish Iron is quoted $70 a ton, and Imported Nail Rods at $77.50 @ $81, ex-ship, according to quality, in large lines.

Structural and Shaped Iron.—Among the larger transactions in Beams we note the sale, by a Pennsylvania mill, of 600 tons to the West and 200 tons to this city. The business in small orders is fair. Angles may be quoted nominally 1.9¢ @ 2.1¢, delivered, for round lots, and Tees at 2.25¢ @ 2.4¢. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders. German and Belgian Beams are dull and unchanged.

Plates.—There is a fair demand for Tank and Girder Plates. Usual prices for round lots of Iron Plates are as follows: Common or Tank, 2¢ @ 2.1¢; Refined, 2¼¢ @ 2⅓¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4¼¢, with concessions for large lines. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2¾¢ on dock; Boiler, 3¢ @ 3¼¢ for Shell, 3½¢ @ 4¢ for Flange, and 4¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2⅓¢ @ 2¾¢; Open-Hearth Machinery, 2¼¢ @ 2¾¢, and Bessemer Machinery, 2¢ @ 2½¢; English Tool, 13½¢ @ 15½¢; Common Grades, 7¢ @ 9¢.

Steel Rails.—The market is decidedly firmer, and we hear of the sale of two lots, aggregating 5000 tons, at $28 at mill, which is the figure quoted by the majority of the mills. There are inquiries in the market calling for about 60,000 tons, one being for 35,000 tons, partly for delivery during next year. The closing of such lots as this will test the question as to how much confidence the mills have in the future.

Steel-Wire Rods.—We note the sale of one lot of 1500 tons and a few small lots in addition thereto. Buying has during the current year been confined to those smaller mills which do not possess Rod trains, the larger concerns having turned entirely to American Billets. Should the producers of the latter succeed in their efforts to advance the price on Steel Rails, the main part of their product, to a considerably higher level, they may insist on a better return on Billets. The recent recovery in Wire Rods may give an impetus in that direction. We quote Wire Rods $41 @ $42.

Old Rails.—The spot supply in this market is limited, but, on the other hand, the demand is light. We note a sale of 300 tons, f.o.b., at $16, which is the best bid, while holders ask $16.50. The demand in the West is active, and a sale by a trunk line of 1500 tons on private terms for delivery at Youngstown is reported.

Old Wheels.—There has been a sale of 200 tons at $15.

Scrap.—The market is dull and nominal at $18 for No. 1 Wrought from yard.

Rail Fastenings.—Spikes may be quoted 1.80¢. Quotations for large lots are 2.55¢ @ 2.65¢ for Bolts and Square Nuts; 2.75¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.55¢ @ 1.7¢ for Splice Bars.

Metal Exchange.

The following transactions are reported:

THURSDAY, August 20.

5 tons	Tin, October	20.75¢
15 "	" September	20.80¢

TUESDAY, August 25.

10 tons	Tin, September	20.45¢
5 "	" September	20.40¢
5 "	" October	20.25¢

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, August 25, 1885.

Pig Iron.—There is not much change to report, the market in all essential features being about the same as it was a week ago. It is singular how much interest is manifested in regard to the Iron trade, and it seems almost churlish not to fall in with the popular side and proclaim depression at an end and general improvement along the entire line. It must be admitted, however, that the market shows no special indications of change either for better or worse. The feeling is better, but prices are no higher and the demand no larger. Under these conditions the change of feeling cannot easily be accounted for—not satisfactorily, at all events. One reason for the return of confidence is probably because the facts warrant it, although not so fully developed as to be clearly discerned. Another reason may be because of the extraordinary advance in railway securities. It is remembered that a similar advance in stocks preceded the remarkable movement in the Iron trade six years ago, and it is the opinion of many well-informed persons that, if stocks can be maintained at present prices, Iron must advance in proportion, and, as other commodities are reported to be stiffening up, why not Iron? This, at least, is the theory; the facts, as we have said, are not fully developed. The volume of business during the week has not been large enough to give increased strength to the market, but there has been no loss of tone, except, perhaps, in Southern brands, which are offered at $14 on dock for No. 3 Gray Forge, also for No. 2 Pennsylvania, which is rather heavy at $16 for ordinary tidewater deliveries. As an offset to this, good No. 1 Foundry and good Mill Irons are rather more firmly held. No advance is asked, but concessions are not to be had, as they were some time ago, while orders for forward deliveries at current rates are not looked upon with much favor. The average of the market, therefore, is unchanged as regards prices, with possibly some little increase in the volume of business, chiefly, however, in the better grades. Prices have varied from $17.50 to $18 for No. 1 Foundry, $16 for No. 2 and $15 @ $15.50 for standard brands of Gray Forge. Special brands, 50¢ @ $1 ℔ ton more money. Tennessee and Alabama brands have been sold at $14 on dock for No. 3 Forge, and $15 for No. 2, with $17 asked for No. 1, but with only very limited transactions.

Foreign Iron.—No transactions have been heard of for some time, although negotiations are in progress for special brands of Bessemer. Prices are unchanged, and nominally as follows: Ordinary Bessemer, $18.50, asked; special brands, $19.50 @ $20. Nothing doing in Speigel, which is held at from $25 to $25.50 for 20 %, but there is no demand. A sale of 7500 tons "Castle" Pig Iron was made to day on private terms. This Iron is to be used for Open-Hearth Steel, and takes the place of Foreign Iron.

Muck Bars.—There is more demand, and with a fairly active business holders are firm at about last week's prices, viz., for good qualities from $27 to $27.50, delivered; sales chiefly at $27, although lower figures are quoted on secondary qualities.

Blooms.—The demand continues slow; asking prices are about as follows: Soft Basic Blooms, $33.50 @ $35; Billets, $38 @ $39, and Siemens-Martin, $40 @ $42; extra quality, $43 @ $45; Domestic Blooms, $30.50 @ $32, delivered, for Nail Plate, and $35 @ $36 for Plate and Sheet Blooms. Charcoal Blooms, $50 @ $52; Run-out Anthracite, $43 @ $44; Scrap Blooms, $34 @ $35; Northern Ore Blooms, $34.

Bar Iron.—The demand shows some further improvement, but not enough to affect prices perceptibly. The feeling is better, however, and, as the mills are nearly all more or less engaged on specialties, there are fewer complaints than usual. Prices are nominally 1.8¢ for best Refined Bars, but the actual selling price is from 1.65¢ to 1.75¢.

Plate and Tank Iron.—A steady flow of small orders is reported at the mills, and manufacturers are all gradually improving their position. Prospects continue favorable, and there is little doubt that a considerable amount of business will have to be placed in course of the next 30 days. Prices are firmer, but unchanged, as follows: Ordinary Plate, 1.9¢ @ 2¢; Tank, 2¢ @ 2.05¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Flange, 3.5¢ @ 3.75¢; Fire-Box, 4¢ @ 4.25¢.

Structural Iron.—A very active business has been done within the past 10 days, orders for something like 5000 tons having been placed for bridge and architectural purposes. Among others, one for about 1000 tons was placed by the New York Suburban Rapid Transit Company, and a number of smaller orders for various roads near at hand. Prospects are favorable for continued activity in the near future, and prices are steady, as follows: Bridge Plate, 2.1¢; Angles, 2¢; Tees, 2.3¢ @ 2.4¢, and Beams and Channels, 3¢.

Sheet Iron.—There has been a considerable improvement in the demand, some large lots having been taken. The large stocks in manufacturers' hands have been greatly reduced, and asking prices are now about ¼¢ higher than they were a week ago, although it is probable that good buyers could place orders at about the following figures:

Best Refined, Nos. 26, 27 and 28	3¼¢
Best Refined, Nos. 18 to 25	3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	5 ¢
Best Bloom Sheets, Nos. 22 to 25	4½¢
Best Bloom Sheets, Nos. 16 to 21	4 ¢
Blue Annealed	2.5¢
Best Bloom, Galvanized, discount	60 %
Common, discount	62½%

Wrought-Iron Pipe.—The demand is very active, and under large sales prices are strong, although not quotably higher. Discounts about as follows: Lap-Welded Black Pipe, 62½ @ 65 % off list prices; Butt-Welded Black Pipe, 45 @ 47½ %; Butt-Welded Galvanized, 35 @ 37½ %; Lap-Welded Galvanized, 45 @ 47½ %; Boiler Tubes, 57½ @ 60 %.

Nails.—Stocks are considerably broken, and in some sizes there is a decided scarcity. Prices firm at $2.15 @ $2.25, with prospects of further improvement in the near future.

Steel Rails.—The firmness noted for several weeks past is still maintained, although we cannot hear of any important sales at the advanced rates. Small lots have been taken at about $29 at mill, and $28 @ $29 may be considered fair average prices. There are plenty of inquiries, but it is hardly likely that large orders will be placed at present, unless at about former prices. It appears as though there would be a stand-off on both sides for a while, so it is hard to determine which side will have the advantage.

Old Rails.—Nothing doing in this market, although there is a better inquiry. Supplies are limited, and chiefly in strong hands, so that they are firmly held at about $17.50, Philadelphia; $18 along the line of railways, or $18.50, Pittsburgh.

Scrap Iron.—There is a fair demand, but buyers are rather close in their selections. Prices about as follows: No. 1 Wrought Scrap, $17 @ $17.50; No. 2 do., $12 @ $13; Horse Shoes, $22 @ $23; Turnings, $13 @ $14; Old Car Wheels, $13.50 @ $14; Old Steel Rails, $16; Fish Plates, $22 @ $23; Cast Scrap, $13 @ $13.50; do. Turnings, $9 @ $10.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., August 25, 1885.

No important change to note in the general business situation during the past week; in some branches of trade an improvement has been developed, and the outlook is generally regarded as being more encouraging. That there is an increasing volume of business is beyond doubt, but thus far there has been very little improvement in prices. However, there must first be an improvement in demand before remunerative prices can be obtained, and it is hoped, now that orders have commenced to come forward more freely, that the time for a fair margin of profit is not far distant. In regard to the labor situation there is nothing particularly new to note. The Nail strike continues. The hitch between the Sheet-Iron workers and the mill owners, it is thought, is in a fair way of adjustment It is claimed that one of the largest river Coal operators has made a contract with his miners to work for a year at 2½¢ ℔ bushel. If this is correct, and it has not been denied, other miners will no doubt accept the reduction.

Iron Ore.—The Ore trade, so far as relates to this place, continues very dull, with but little prospect of immediate improvement. Probably one-half of the Ore-consuming capacity here is idle, and consumers are not disposed to contract ahead.

Pig Iron.—Commission men report that there is not much difficulty in making sales; that consumers are more willing to buy, while purchasers are less disposed to sell. It is evident that the turning point in this respect has been reached. While prices are as yet no higher, there are furnacemen who are refusing to sell at from 25¢ to 50¢ ℔ ton higher than they would have accepted a month ago. Our city furnaces are now stiff at $14.50, cash, to $15, four months, for their No. 1 Neutral Mill, and it is doubtful whether they would contract for future delivery at the prices quoted. However, there are still large quantities of Iron here and elsewhere owned by individuals, banks and insurance companies, taken as collateral for money, a large proportion of which will be pressed on the market and put into the hands of consumers as soon as possible. The trouble with these hypothecated Irons lies in the fact that they are of different makes, the product of different furnaces, which is a serious obstacle in the eyes of consumers generally. There has been a very decided increase in consumption here within the past few weeks; probably three-fourths of the puddling furnaces are now at work, many of them running double turn, and with a marked improvement in the demand a firmer market is a natural and legitimate result. We quote prices as follows:

No. 1 Neutral Mill	$14.75 @	$15.00,	4 mos.
No. 2 Neutral Mill	14.00 @	14.25,	4 "
White and Mottled	13.50 @	14.00,	4 "
All-Ore Mill	15.50 @	16.00,	4 "
No. 1 Foundry	16.50 @	17.50,	4 mos.
No. 2 Foundry	15.00 @	15.50,	4 "
All-Ore Foundry	18.00 @	19.00,	4 "
Charcoal Foundry	20.00 @	22.00,	4 "
Cold-Blast Charcoal	25.00 @	27.00,	4 "

Manufactured Iron.—Orders continue to come forward more freely, and the mills generally are pretty well employed, but as yet there has been no improvement in prices, although they are firmer. Quotations may be fairly made on a basis of 1.6¢ @ 1.7¢ rates for Bars for Iron of good quality, 60 days, with usual discount of 2 % for cash. The Pipe mills being very busy makes an active demand for Skelp Iron, and those mills making Bridge and Structural Iron still appear to be pretty well employed. The indications are that there will be at least a fair trade until the close of the year, and manufacturers are hopeful of being able to realize better prices.

Nails.—There has been no change in the situation during the past week. Business continues light, nor can any improvement be looked for while the strike continues, as manufacturers have little or no stock to do business with. While there is not much inquiry, it is owing largely to the fact that buyers know the situation here and that our manufacturers are not in condition to fill orders, and we apprehend that a great many Western orders are going Eastward. The strike is a good card for Eastern manufacturers, as it has enabled them to get into the Western markets, and it is hardly necessary to say that they have made the best of it. The cheap rail freights from the seaboard to the West are in favor of the Eastern manufacturer. However, the Western manufacturers will no doubt be able to reclaim the most of their trade soon after starting up again.

Wrought-Iron Pipe.—The Pipe mills are all busy, some of them unable to catch up with their orders; some of the natural-gas companies find it difficult to obtain Pipe as fast as they want it. Indications are that the Pipe mills will have all they can do until the advent of winter, possibly until the close of the year. Prices firm, but unchanged. Discounts on Black Butt-Welded Pipe, in car lots and upward, 47½ %; Galvanized do., 37½ %; less than car lots, 45 % and 35 %; on Black Lap-Welded Pipe, in car lots and upward, 65 %; Galvanized do, 47½ %; less than carload, 62½ % and 45 %. Discount on Boiler Tubes, 60 %. Two-Inch Line Pipe, 10¢ ℔ foot, net; 2-Inch Tubing, 11¢; 8-Inch Dry Pipe $1.15; 5⅝-Inch Casing, 36¢ ℔ foot, net.

Steel.—The Merchant Steel trade is reported more active, but prices remain unchanged. Best brands of Refined Cast Steel, 8½¢; do. Crucible Machinery, 4½¢ @ 4¾¢; do., Open-Hearth, 2¼¢ @ 2½¢. There is but little doing in Nail Slabs, nor is it likely that there will be any improvement while the strike continues and the factories remain idle.

Steel Rails.—The market is considerably stronger, and not without reason, as the mills both here and elsewhere are well sold up; some of them, it is said, have about all they do for the rest of the present year. Prices are firm and higher. Heavy sections for immediate delivery are now quoted at $28 @ $29, cash, at mill, but as yet few sales have been made at the advance, most of the large orders having been placed prior to the recent advance.

Old Rails.—There have been no sales of Old Iron Rails reported recently, in the absence of which we quote at $18 @ $18.50. So far as we can learn there are no sellers under $18.50, but buyers do not want to pay more than $18. Old Steel Rails still quoted at $16.50 @ $17.50, according to lengths.

Railway Track Supplies.—Trade continues slow, while prices remain unchanged. Spikes 1.90¢, 30 days, delivered; Splice Bars, 1.60¢ @ 1.70¢; Track Bolts, 2.75¢ @ 2.85¢.

Crop Ends.—There has been but little inquiry for new Steel Rail Ends of late, and we quote nominally at $18.25 @ $18.50; Steel Bloom Ends, $17 50 @ $17.75.

Old Material.—There is a fair business, and the feeling obtains that prices have about reached hard pan. No. 1 Wrought Scrap, $16 @ $17, net ton, outside figure for Selected Railroad; Wrought Turnings, $12 @ $13; Old Car Axles, $23 @ $24; Cast Borings, $10.50 @ $11, gross ton; Old Car Wheels, $14.50, gross ton.

Window Glass.—Trade is reported better; no change in prices. Discounts on Double Strength, in car lots, 75 and 5 %; Single Strength car lots, 70 and 10 %. The factories after a suspension of two months will start up September 1st.

Coke.—There is a moderate business; no change in price. Blast Furnace Coke still quoted by the syndicate at $1 20 ℔ ton on cars at ovens.

Coal.—Natural gas has curtailed the local trade very materially. Nearly all manufactories are now using natural gas, and many families are using it in place of Coal. Efforts are being made to find natural gas elsewhere.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., CHICAGO, August 24, 1885.

Hardware.—Jobbers report that "goods are going out very nicely," and that they are having "quite an increase in the quantity of goods ordered by old customers." Many inquiries are made through the mails asking about prices on goods for September and October delivery. A prominent jobber remarked, "I believe we are entering a new era in the trade." Business for the week was considerably in excess of that for the previous week, with favorable indications that it will continue to increase. Manufacturers are refusing to enter orders for future shipment, and make quotations only for immediate delivery. On the whole line of Hardware they are talking "better" prices, and predict that it will not be long before they can cut down discounts to a more remunerative basis For the past week no change in prices is announced, though a firmness in quotations applies to all lines of goods.

Barb Wire.—Market quiet. From distant points a few of the manufacturers are accepting orders for occasional car lots at ½¢ advance for delivery between now and October 1. Trade among jobbers has slightly improved, and the number of inquiries regarding the progress of the Combination Company vastly increased. From the latest information on the subject it is not likely that the company will be able to perfect their arrangements before October 1, as the Committee on Signatures have been greatly delayed by absent manufacturers and their own vacations. A meeting is called for Thursday, the 27th, to hear the reports of committees and further perfect their organization. The 15 % advance announced to go into effect September 1 will not be officially made by the new compmy, but individual effort will be exerted to obtain a better figure for deliveries pending the final settlement of details. Makers are quoting Painted Two-Point Cattle Wire at $3 50, and Four-Point Hog Wire at $3.60, in carload lots, while jobbers are selling small lots from store at the same figures. Unlicensed Wire, it is reported, has been sold below this price, delivered to any part of the West and Northwest this side of the Rocky Mountains.

Nails.—Market in about same condition. Western stocks of Iron Nails are pretty well exhausted in the leading sizes. Other sizes are now offered by makers at a shade under regular prices for the purpose of cleaning out everything they have, and this has given rise to the report that Nails are selling in carload lots as low as $2.15. There have been odd lots sold from store at $2.20, but in these lots a large proportion were of the sizes that jobbers are anxious to get rid of and would be willing to sell at almost any price if the entire lot were taken. The market price for Iron Nails, including the "leaders," is $2.25, though $2.30 is a standing quotation. Steel Nails have not varied any in price, $2.40 being asked and obtained from store. Those who have an assortment of Steel Nails decline all orders for car lots. Some improvement has been noticed in the condition of stocks of Iron Nails in jobbers' hands recently. Eastern manufacturers have been delivering back orders and making additional sales at figures ranging from $2.10 to $2.15 on cars here. Feeders at Youngstown and Terre Haute have quit work and joined the Nailers' Association.

American Pig Iron.—A little more activity and a great many more inquiries are reported. There has been a fair demand for carload lots, and several sales of 100 tons each of Lake Superior Charcoal Iron, and one sale of 1000 tons Southern Iron, delivered in Milwaukee. Large-lot buyers have been conspicuous by their absence, though rumors are circulated that they still exist. It is evident, however, that they are not ready to place their orders, and, so far as can be seen, trade for some time must come from the small-lot and carload patrons. Several of the best brands of L. S. C. Iron are sold up for the balance of the year, and other furnaces with scarcely less reputation say that they have contracted for enough to place them in an easy position. There is an abundance of Charcoal Iron to be had yet, but makers are not so ready to sacrifice their margins to effect sales. Standard brands Lake Superior Charcoal, in carload lots, are quoted at $19 four months, for Nos. 1, 2 and 3, and $19.50 for Nos. 4, 5 and 6. Some distinction continues to be made in favor of certain brands which might shade quotations 25¢ @ 50¢ ℔ ton. Lake Superior Coke, All Ore, is dull—sale at $18; Cinder Mixed is quoted at $17; Ohio Standard Blackbands are tolerably free—sale at $18.50; Southern Irons have been selling more freely than several weeks ago, at $16 50 for No. 2: $15.75 for No. 2½; $15 for No. 3, and $13.50 @ $14 for Mill Iron. To all appearances the market continues firm, with no sellers who will make concessions from what

may be called an established price. Even though higher prices do not prevail, it is regarded as quite refreshing to hear furnacemen say they have named their lowest figures and stick to it. The position is looked upon as the turning point, and the encouraging reports from manufacturing centers enliven the hope of a better trade and higher prices.

Structural Iron.—In addition to the "small-lot" trade, a contract of considerable importance was made last week. Large buildings have been very scarce this year compared with last, and when specifications are out for one the letting of the work is watched with unusual interest. The latest dodge is to invite the parties bidding on the Ironwork to take stock in the building, which presumably admits of the contract being influenced to those who are the most liberal subscribers. Specifications are now being prepared for another large structure to be completed this fall. Altogether, the the trade is fairly active and mills are well employed. Prices quoted heretofore are unchanged.

Merchant Steel.—Negotiations on a large lot of Steel, for which specifications were sent out several weeks ago, were closed last week. The sizes, shapes, &c., were such as would be required in a large harvesting-machine manufactory, and altogether a desirable order. The figures at which this order was taken are not definitely stated, but it is known that they discount anything heretofore made public. This has not improved the market, which has for a long time been weak and badly demoralized. Trading is principally in small lots, and so irregular that nothing more than a nominal quotation can be made. The demand for the higher grades of Steel and specials is gradually improving, but it is said to be a tiresome job to take orders for this quality when pitted against some of the well-established brands at less figures. Tool Steels are quoted at 7½¢ @ 9¢; Bessemer, 3¢; Open Hearth, 2¾¢; Crucible, 4¼¢; Plow Steels, 2¾¢ @ 5½¢.

Steel Rails.—A better demand is reported for small lots. More inquiries are being made than for some time previous, but it is said that only a small proportion of them result in orders. Inquiries are also being made for Rails to be delivered in 1886. Mills are busy at present and will continue to be if the hand-to-mouth business holds on at the same rate. The nominal quotation at mill is $29 for heavy sections.

Bar Iron.—The market last week was a little more active in a general way. The increase in small orders is beginning to tell in the aggregate footings of those who are handling the New Puddled Iron. Quotations on Best Refined remain at $1.80 rates from store, and $1.65 @ $1.70 from mill. Common Iron in small lots is quoted at $1.70 rates from store and from mill in round lots sales have been made at $\frac{1}{10}$ below these figures. One large order was taken from a consumer recently at a fraction of this price, but it embraced a large number of extras. The Calumet Rolling Mills, which have been closed down for some time, have given employees notice that the mill will remain closed indefinitely.

Old Rails.—There has been a trifle better demand during the past week. Stocks for sale are not plentiful at prices bid. Quotations range from $16.50 to $17 in this market, and $16 at Milwaukee, which are not acceptable to those who can hold the Rails.

Black Sheet Iron.—The market was very active last week. Jobbers, however, were more active in trying to get stock to meet their demand than in selling. Stocks are said to be badly broken, and mills decidedly independent about taking orders. They decline in most cases to book orders for delivery before the first of October, and are asking prices which the jobbers cannot realize at present. Not a little amusement is now had at the expense of those who in May last positively did not want Iron at any price and are now offering 20¢ @ 30¢ more ₱ 100 than makers were then asking. From store we quote No. 24, $3; Nos. 25 and 26, $3.10, and No. 27, $3.20.

Galvanized Iron.—The amount going out was considerably increased last week. Stocks are very light, some warehouses not having a single bundle of the leading sizes. Makers are well supplied with orders, and no cutting is now heard of among the manufacturers of leading brands. Orders are principally for small lots, and many of them come from the cornice trade. Other branches of consumption are not doing so well. Prices are very much stiffer from first hands, but changes have been made. We quote from store, Juniata 60 % off, and Charcoal, 60 and 10 % off.

Old Wheels.—A better market prevailed last week. There was an increase in the demand for car lots, and several sales of 50 and 100 tons each were made. Quotations range from $14, cash, bid, to $15 @ $16, asked, f.o.b. Chicago.

Scrap Iron—Met with a stronger demand than for several weeks past. The market is by no means active, but a much better feeling prevails. Mills are quoting $13 50 @ $14 for No. 1 Mill Scrap, and $8.50 @ $9 for No. 2. Selected Forge was held at $16.50 by dealers, with a fair inquiry for stocks for shipment to foreign points. Dealers' purchasing prices are not changed from our last quotations.

Pig Lead.—The market has been fairly firm during the past week at $4.15, though several sales are reported at $4.20. Consumers being pretty well supplied at present, there is less concern regarding the movements of speculators, who allowed the price to weaken about 5¢ toward the close. The St. Louis market was somewhat stronger, and sales aggregating 600 tons are reported at $4.20 to consumers.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., August 25, 1885.

Secretary Manning, in connection with his circular of inquiry in regard to undervaluations, is also making some important reforms in the administrative branches of the customs service.

PROTESTS AND APPEALS ON "CHARGES."

It appears that Section 7 of the act of March 3, 1883, abrogating all charges theretofore required to be added to the market value in estimating dutiable value, has been ignored. The Secretary calls attention to the opinion of the Attorney-General, which says: * * * "As regards the basis on which ad valorem duties are to be estimated, the only change effected by Section 7 of the act of 1883 is to exclude from such basis all costs and charges which, under the law as it previously stood, were required to be added to the current or actual market value or wholesale price of the merchandise in the principal markets of the country whence the same was imported, or of the country of production or manufacture, as the case might be. Thus the current or actual market value or wholesale prices in those markets, which is to be appraised, is now made the sole basis for estimating such duties." The Secretary, therefore, orders that in ascertaining the actual foreign market value it must be made to clearly appear that "charges," as such, are not included as an element thereof.

FEES TO MERCHANT APPRAISERS.

The Secretary of the Treasury has rendered an important ruling regarding the payment of fees for the services of merchant appraisers on reappraisement of dutiable articles, which will put a stop to the excessive emolument derived from such sources. It appears that the merchant appraisers at New York have been in the habit of levying a charge of $5 on each case of an importer, and attend to a number of cases in a single day, thus realizing a sum largely in excess of the amount allowed by law. The Secretary has instructed the collector at that port that, in case of a merchant acting as reappraiser should act in cases of other importers on the same day, he is not entitled to $5 per day from each, but only $5 per day in the aggregate from all, and that the several importers should be called on to contribute *pro rata* for the purpose of making up such compensation. The same will be applied to all ports.

REAPPRAISEMENT FINAL.

The Treasury Department is in receipt of a large number of requests to interfere for the purpose of relieving parties from the payment of additional duties assessed upon reappraisement. The Secretary has declined to accede to the requests. Under Section 2930 of the Revised Statutes, the reappraisement is final and conclusive, as well against the importer as against the Government, and the result thereof cannot be changed or affected in any manner, except upon its being made to appear that the reappraisement was irregular or fraudulent.

ARCHITECTS' MODELS NOT TOOLS OF TRADE.

The artifices resorted to by partities to evade duties display great diversity of ingenuity. In reply to an appeal from an assessment of duty on certain objects of art claimed to be entitled to free entry as "tools of trade" by a member of a firm claiming to be a professional architect, the Secretary of the Treasury says: "The articles consist of worsted tapestries, carpets and curtains, wool rugs, one altar-cloth, one piece of wool cloth, plain and decorated earthenware, an iron stand for holy-water, photographic views, manufactures of iron, brass and copper, furniture and manufactures of silk and cotton. The department is of opinion that articles of this character are not the implements, instruments and tools of trade, occupation and employment contemplated by the provision of law under which exemption is claimed, and the appeal is therefore rejected."

BOILERS.

The following important decision in regard to boilers has just been rendered by the Treasury Department: "The object of the clause in Section 22, Rule 2, requiring that 'all upright tubular boilers used for marine purposes shall have a fusible plug inserted in one of the tubes, at a point at least 2 inches below the lower gauge-cock, and at least 21 diameters of the tube above the lower crown-sheet,' was not intended to exclude a boiler when the tubes are less in length than 21 times their diameter, the only object of the rule being to insure the insertion of the fusible plug, as required by Sections 4418 and 4436 of the Revised Statutes, 2 inches below the lower gauge-cock."

STORAGE CHARGES ON IRON SOLD AS UNCLAIMED.

In the sale of 391 bars of railroad iron sold as unclaimed warehouse goods at Galveston, Tex., $1800 was realized, of which $1486.53 was the amount of duties, $189.24, the expense of sale, $103.20 storage, leaving but $21.03. The proprietors of the bonded warehouse refused to deliver the merchandise to the purchaser, except upon payment of $975, their charges. The Secretary has ruled: The question involved in this case, as to whether the charges for storage can take precedence of the payment of duties, was referred to the solicitor of the Treasury for his opinion in the case. It will be seen that the solicitor holds that the storage charges cannot be a lien on the said property; that if the proceeds of sale are insufficient to pay such storage after payment of expenses and duties, the warehouse keeper must look to the importer, and not to the property, and that the warehouse keeper cannot legally refuse delivery of the property to the purchaser by reason of the non-payment of such storage.

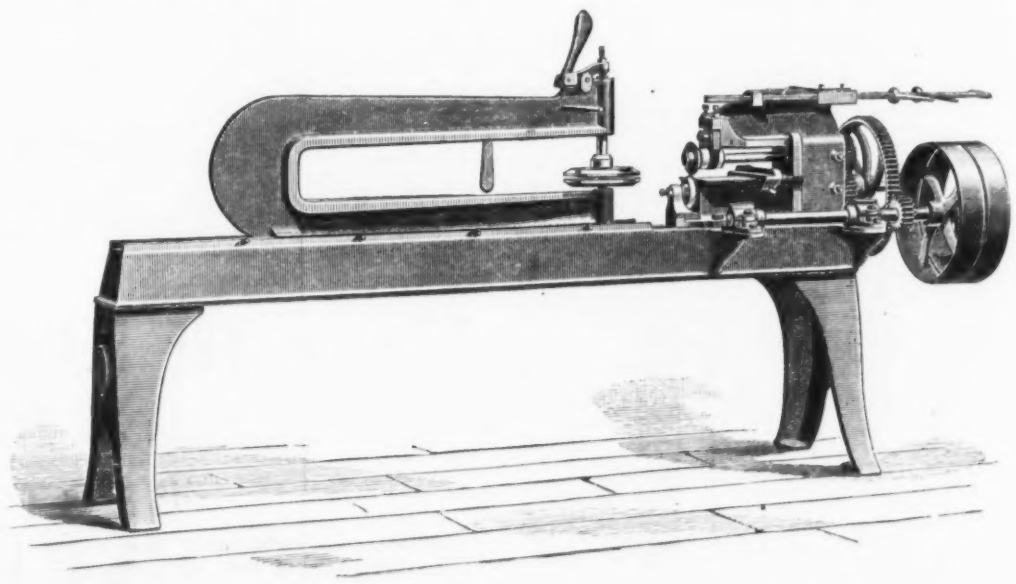
IRON "ACME" SOCKETS.

The department decided that certain castings, consisting of sockets for patent picks, which had undergone no additional process other than being rolled in a cylinder for the purpose of cleaning, were dutiable at the rate of 2 cents per pound, as castings. It now appears, however, that the sockets now under consideration are very different from those referred to above, as they have not only been subjected to the cleaning process, but have had the keys and bastions inserted, and are in readiness for the reception of the pick. In view of the above, the department is of opinion that the sockets in question cannot be classified as castings merely, inasmuch as they have been advanced in manufacture, and are provided with keys which appear to be made of wrought iron. The assessment of duty thereon at 45 per cent. ad valorem, as manufactures not specially enumerated or provided for, composed wholly or in part of iron or steel, is affirmed.

SYNOPSES OF DECISIONS.

Cuttings of steel wire of different gauges, cut into uniform lengths of 1 inch, do not constitute the steel wire of commerce (which is uniformly imported in coils), and are dutiable at the rate of 45 per cent. ad valorem, under the provision in Schedule C, T. I., new, 216, for "manufactures, articles or wares * * * composed wholly or in part of * * * steel."

White lead prepared in oil, and put up in tubes for artists' use, is dutiable at the rate of 3 cents per pound, under the special provision for white lead, "when ground or mixed in oil," in Schedule A, T. I., new, 56.



Combined Slitting and Circular Shear, Built by the Niagara Stamping and Tool Co.

Combined Circular and Slitting Shear.

The Niagara Stamping and Tool Company, of Buffalo, N. Y., have brought out a new form of power back-geared circular and slitting shears which possesses features that recommend it to use in sheet-metal working establishments generally. The machine appears to be well adapted to the wants of cornice makers, tank-builders, manufacturers of blowers, and also for use in sheet mills for circling blanks and for other similar purposes. The bed of the machine, as may be seen from the engraving, is heavy and is very strongly braced. The cutters are made of the best English cast steel and the shafts are also of steel. The makers assert that the workmanship throughout is first-class. The shear is adapted for all gauges of iron up to and including No. 10. In straight work it will slit the center of a 30-inch sheet, and in circular work has a capacity from 3 inches in diameter up to 54 inches in diameter. While constructed for use with power, we learn from the makers' circular that a crank can be attached, so as to work the machine by hand.

The Shickle, Harrison & Howard Iron Company, of St. Louis, are now turning out an average of 140 tons of finished castings a day, a melt of iron equal to the production of two good-sized blast furnaces. A short time ago they made a shipment of five or six carloads of pipes to Japan via San Francisco. Pacific Coast orders for pipe at present in hand embrace one for 200 tons for Portland.

The Hooping of the Dome of St. Peter's, Rome.*

If guide-books and other descriptions of Rome are to be taken as evidence, it would seem that among the "things not generally known" the iron bands which encircle the drum and dome of St. Peter's may be included. Soon after Bernini had made staircases and niches in the great piers it was observed that the cupola was rent, but no importance was attached to the defects. Carlo Fontana was appointed architect in charge of the Basilica, and he wrote a book to give the world assurance of the safety of the building. But in spite of talk and type the cracks became larger, and in 1742 the subject excited commotion in Rome, when a scientific commission was appointed. According to the London *Architect*, the following account of their inquiry was compiled by Cardinal Wiseman from the original reports, and is published as a "Bygone" by the kind permission of Messrs. Hurst & Blackett. It may be added that the conclusions of the reverend scientists were generally accepted. Out of 19 opinions which were obtained on the report, the majority agreed that the hooping was the best device.

Giovanni Poleni was, however, summoned from Naples, and he expressed an opinion that the dome was not in danger. He attached no importance to the cracks, which he considered were partly the results of the enlargement of some of the piers, by which they sank more than others, and partly the results of hasty building. The variation of the drum from the perpendicular he ascribed to settlements, and not to the pressure of the superincumbent dome. But as Poleni advised the adoption of five circles of iron around the dome, it may be said that he came to the same conclusion as the mathematicians, who proposed six colossal hoops to give security to the cupola. A seventh was added, and there are now eight. The work was completed in 1747, and was carried out under the direction of Luigi Vanvitelli, or Van Witel, the architect of the Caserta Palace, the Convent of Sant' Agostino and other buildings in Italy. Each hoop consisted of 30 pieces, and they are covered with brick in order to be preserved from rust. There is a popular idea current that Michael Angelo made the huge piers, on which the dome had to rest, so exactly proportioned to the weight they had to bear that he even made a dying request that they should never be touched; that they were afterward perforated to make some staircases and niches, and that the consequence was that the whole dome was threatened with ruin. All this is incorrect It is not likely that Michael Angelo, whose characteristic was massiveness to excess, would have so offended. But in addition it deserves to be mentioned that, at the time when he built these piers, a commission was appointed, of which Raffaele, it is thought, was a member, to examine them; and that their report was that the piers should be still further strengthened. Immensely deep wells were accordingly sunk at their feet and filled with Roman concrete, so as to give great additional support. "It will be useful," says Cardinal Wiseman, "to give you the exact dimensions, in English feet, of the great masses concerned in what I am about to speak of. Piers on which the dome rests, 282 feet round; cupola, diameter, 141½ feet; circumference, about 423 feet; hights of arches on which it rests from the pavement, 146 feet; hight of lower edge of dome, 171½ feet; total hight to summit of lantern, 446½ feet."

Perhaps the greatest promise ever made by art, and faithfully kept, was here. Michael Angelo is said to have declared that he would raise the Pantheon up into the skies. These dimensions show how he kept his word. About 1681 it was observed that there were numerous cracks in various directions through the cupola, and great blame was thrown upon Bernini, who was accused of having made dangerous staircases and niches in the piers; however, his friend the biographer, Baldinucci, produced plans of earlier date, in which these alterations were marked, thus disproving that Bernini had been their author. He moreover speaks of the fissures then apparent as trifling. But they went on increasing. What are called in Italy seals—that is, marble dovetails,—were placed across the cracks, and these broke or were breaking with alarming rapidity. It was evident that the work of destruction was going on, and before the middle of the last century it was feared that in a few years more the whole dome of St. Peters might fall in; Architects came forward to suggest various remedies for the threatened evil. One wanted to block up the windows, another to made great spurs or buttresses, in addition to the columns that surround the cupola, to give it strength. In truth, the whole structure would have been disfigured by the proposed expedients; but, in reality, it was difficult to find a remedy. Benedict XIV, a most able and learned man, was Pope at the time. He wisely observed that this was not the business of art, but that it belonged to science. So he named a special commission of three mathematicians—pure mathematicians, having nothing to do with building or architecture, to examine the case. When their names are mentioned, scientific persons will easily understand how they were selected.

At the head of the commission was Father Boscovich, a Jesuit who had twice measured arcs of the meridian, and had published a number of works on astronomy, on the spots on the sun, on optics, and many other philosophical subjects—a man, in truth, of European reputation, and one of the first men in Italy who accepted the Newtonian system. The other two were not Jesuits, but of another religious order. They were the editors of what is commonly called the Jesuits' Edition of Newton, Le Sueur and Jacquiert—men purely and exclusively scientific. As they drew up a minute report of their proceedings, under the modest title of "Opinion of Three Mathematicians," and presented it to the Pope, I have only to abridge their own account of them. It was given in at the close of 1742. Their first care was to examine most minutely the entire dome, within and without, and form thus a plan of all the injuries which it had suffered. They give an accurate list of 32 distinct damages, some very severe, and running in various directions. The stone lintels over several of the windows were split in two; and when they applied a plumb-line to the buttress pillars round the drum or cylinder of the dome, these proved to be as much as over an inch out of the perpendicular.

This naturally pointed to the overpressure of the spheroidal portion, with the lantern above, upon the drum. But our three mathematicians were not satisfied with this simple deduction; they carefully examined the piers to which popular judgment attributed the damage, and they found that judgment to be erroneous. The piers were intact, and required no attention. They therefore advised that nothing should be done to them. Thus having formed the hypothesis of overpressure, they proved that every phenomenon, to the slightest crack, fell into it, and was adequately explained by it and by no other. Their next step was to verify most exactly the reality of what they had theoretically ascertained, by weighing, on the one hand, the materials supported, and measuring, on the other, the sustaining power. They found that the entire dome, with its lantern, came to the frightful weight of 165,000,000 Roman pounds, or 55,245 tons. They obtained separately the weight of the gravitating portion, and then calculated the resistance or supporting powers. This consisted, first, in the drum (*tamburro*), with its pillars thrust already out of the perpendicular; and, secondly, of an iron girder, too slight for its purpose, but so embedded in the wall that it could not be examined. They estimated, however, its tenacity, and took it into reckoning; but conjectured that it had either snapped or dilated, so as to be useless. But they thus reached the result—that there was a balance of 5,000,000 pounds, or 1674 tons, on the side of pressure against support. The conclusion of the mathematicians was "that an irreparable ruin was reasonably to be apprehended unless a timely and efficient remedy were applied."

We may well imagine the alarm of Rome, with its artistic population, at such an announcement as this, and at hearing that this collapse and ruin had only been prevented so far by an iron collar round the base of the lantern, and by the peculiar construction which united the double dome to this, so as to prevent its falling out. It is easier to find a defect and prognosticate misfortune than than to remedy the one or to avert the other. But the commission to the three mathematicians was not only to probe the evil, but also to suggest its "efficient cure," which they consequently proceeded to do. Well, what sort of a remedy did they suggest? One entirely scientific, and not a little appalling. It was to put six more solid girders round this huge periphery of 420 feet. Each, of course, was to be divided into several sections or arcs, and where these met each had to branch into three, and these branches proceeding from the two arcs were to be fastened by bolts passing through sockets in them, the bolts again being riveted to chains passed round the building. A gigantic or Cyclopean undertaking, for you must remember that there were then and there no Nasmyth's hammers or Birmingham rolling mills, so that the enormous hoops had all to be forged and shaped by hand.

Of course, no sooner had this report appeared than it was assailed in all its parts—groundwork, deductions and proposals. To vindicate it, and reply to the objections so gravely urged, and, at the same time give an account of further proceedings in the matter, a second memoir was drawn up by the same learned men, early in the following year. A meeting of the general committee was then held, comprising achitects, antiquarians and others. A fresh examination was made, and finally the decision of the "three mathematicians" was adopted, and their proposal accepted. There was no time to be lost, and no time was lost. Before the end of that year, 1743, two girders were braced round the drum. In 1744 three more were added. According to Poleni, their weight amounted to 119 044 Roman pounds, or 39 tons. In 1747 it was found that the "mathematicians" had conjectured rightly, that the girder put in under Sixtus V had sprung, and another was substituted for it. These iron circles are not visible, but are imbedded in the stonework. The proposed cure fully answered, and now, after 120 years, no sign has been given of subsequent damage; but the seals or dovetails placed over the former fissures, left purposely open, are unbroken and unmoved.

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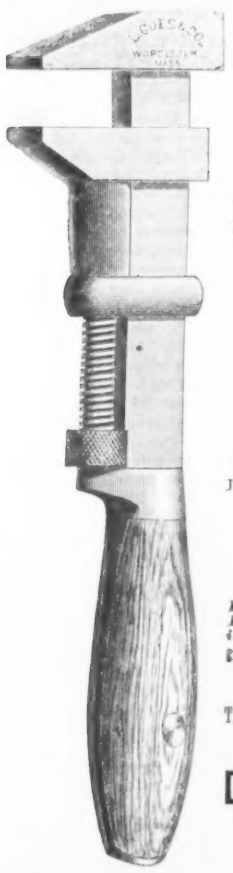

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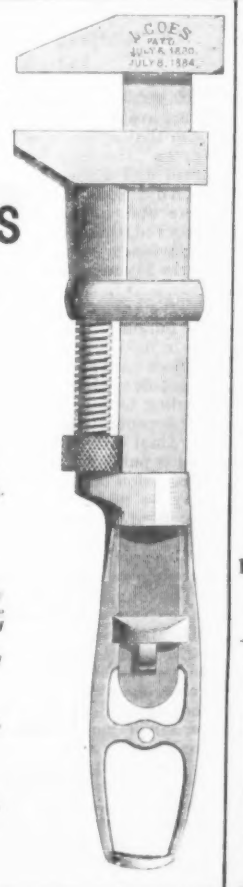

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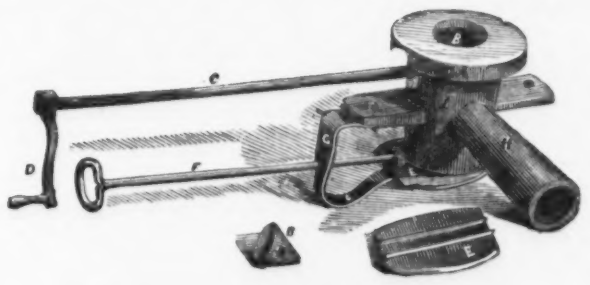

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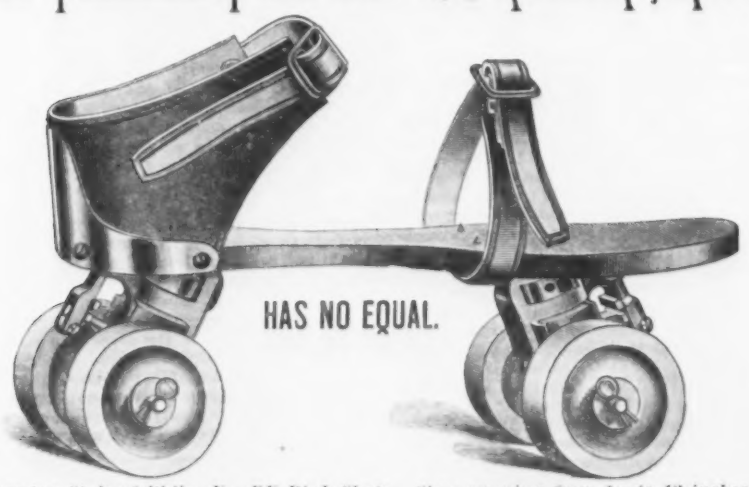

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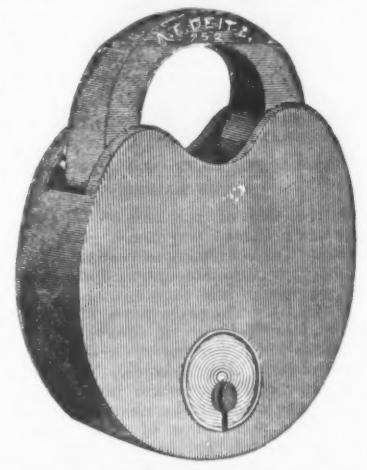

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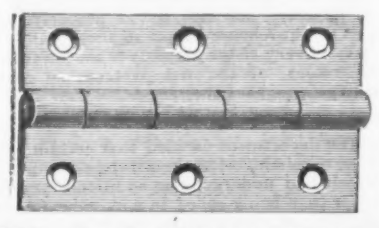

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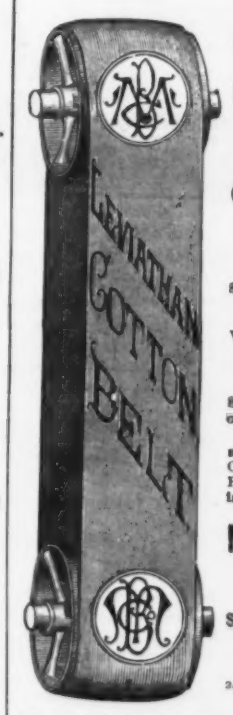

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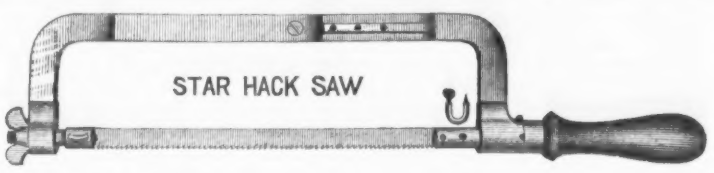

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Agricultural implements and machinery not otherwise enumerated, garden lawn mowers, garden pumps, garden rollers, garden syringes, gas-work machinery, and material for other than iron gas-pipes, iron bridges and materials not otherwise enumerated for construction of bridges, railway plant and materials, not otherwise enumerated, for the construction of railways or tramways, 5 per cent. ad valorem.

Hessian baskets, wicker-ware, bellows (other than blacksmiths'), bicycles and tricycles and parts of the same, brass cocks, valves, union lubricators, whistles, building materials not otherwise enumerated, castings of metals not otherwise enumerated, iron bolt ends, blank nuts and washers, girders and columns for buildings, magic lanterns and all apparatus and appliances for same, perambulators, pumps and other apparatus for raising water, watchcases and watch movements, 17½ per cent. ad valorem.

On all goods, wares and merchandise not enumerated above or in the table of duties of customs annexed to the Customs Law Consolidation act (1882), and not included in the list of articles exempted from duty by subsequent resolution, there shall be charged a duty of 20 per cent. ad valorem. In the event of any of the duties hereby imposed not being confirmed, or of redirections being made in the rates specified above, the amount levied, collected and paid in excess of the duties as may be imposed by the Customs act, based on these resolutions, shall be refunded to the persons who paid the same.

FREE LIST.

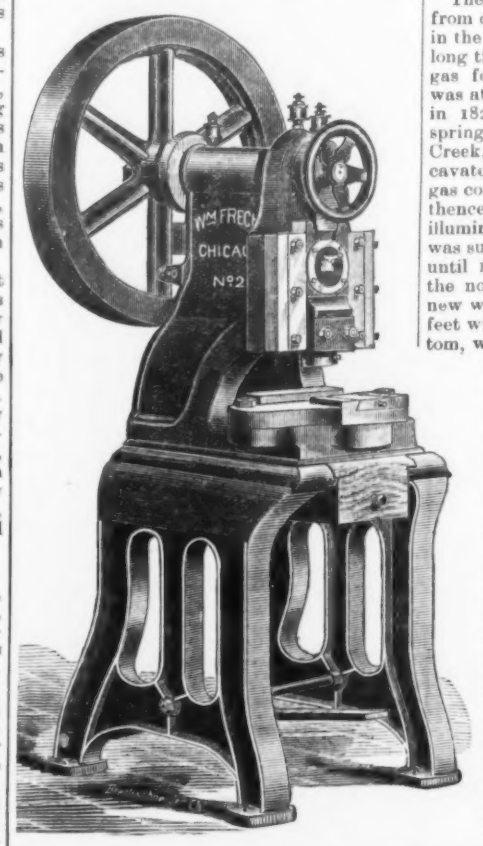
Carbon, asbestos, axe and hatchet handles, belting, blacksmiths' bellows, blocks, iron, boilers, brass rods and tubes, bronze, carriage and cartmakers' materials, viz, brass carriage hinges, lamps, lining, nails; caoutchouc (crude), rows chains, iron chains, twisted coil, church clocks; composition, anti-fouling, for ships' bottoms; copper, brass or bronze in ingots, bars, tubes or sheets; copper rivets and washers, sulphate of copper; deck scrapers and scrubbers, draining tools, electric-light apparatus and machinery, electric-light incandescent lamps, emery cloth, blacksmiths' tools, fire brigade helmets, belts, lamps, tools, hydrants, hose, nozzles and couplings and ladders; garden tools, gas engines, grindstones; grindery, viz., lasting tacks (brass and iron), rivets (brass, iron, and copper,) cuttsell steel point, and sparrow-bills (wrought, cut and malleable), hobnails, Hungarian nails (wrought and cut) tip nails, brestles, shoemakers' hemp and flax, eyelets and hook eyelets, tingles, copper toes, punching and eyeleting machines, sole, steel, stiffening and toecaps, knives, heel-ball, and burnishing and riveting stands for iron lasts, gutter bolts and nuts (galvanized); hayforks, ventilators, hones and whetstones, hooks and thimbles, iron, horns and hoop; horse-rasps, india-rubber sheet for engine packing, iron, gas and water pipes, iron range screws, rails for railways and tramways, wire not otherwise enumerated, tees, elbows, bends and crosses for water and gas pipes; knitting machines, safety lamp for collieries, lighthouse apparatus, machinery for biscuit-making, boot and shoe making, candle-making, cheese making, confectionery-making, lead-pipe making, leather-splitting, meat freezing, perforating paper, sugar-making and refinery, threshing, tinsmiths; magnets, metal sheaves for blocks, mill stones, models of inventions or improvements, but not such as can be fitted; needles, philosophical apparatus or instruments, communion plates, iron for malt kilns, plumbago; pulver, quicksilver, threshing machines, recruits' rifles and other military small arms, ordnance and other war materials other than rifle ammunition; gunpowder and explosives imported for the service of the colony and at the public charge; rosin, rotton stone, saddlers' ironmongery and material, viz., stirrup-irons, trace chains, cut or uncut back bands, bits, clout tacks, and articles of iron and metal required to complete riding or driving harness for horses; ship chandlery not otherwise enumerated, ships' fittings which have been used on the voyage; silver plates (plain, rolled and unadorned), solder, spelter, steam hammers, steel bar, rod and plate, and steel rails for railways and tramways; surgical instruments, surveyors' instruments, telephones, tinfoil; vises (blacksmiths' and bench), wire cloth for quartz-crushing machinery, wire rope, wire (gold headed and galvanized), flat and Italian zinc, chloride of zinc.

The American Institute Exhibition.

The Board of Managers of the American Institute of New York have determined to open their 54th annual exhibition, at the Institute building, Third avenue, Sixty-third and Sixty-fourth streets, on Wednesday, September 30 next, and are now busily engaged in arranging and perfecting the details incidental to a show of such magnitude as this always is. The building is now being put in thorough repair, and is to be entirely redecorated and painted throughout in order to make it bright and cheerful. Already a large number of applications for spaces for all kinds of exhibits have been received, and judging from the character of these entries the coming exhibition promises to be more than usually interesting, and many very great novelties in the way of machinery and other things are promised. The exhibition will be divided into seven departments, consisting of Fine Arts and Education, the Dwelling, Dress and Handicraft, Chemistry and Mineralogy, Machinery, Intercommunication, and Agriculture and Horticulture. These again will be subdivided into seven groups each, each group having three judges, who will examine all articles exhibited and make their report thereon to the Board of Managers, by whom the awards of prizes will be made. Intending exhibitors should send their applications for space to Mr. Chas. Wager Hull, the general superintendent, at the offices of the Institute, Clinton Hall, Astor place and Eighth street, New York, who will also furnish proper forms and any information that may be needed. The entrance fee for exhibitors will be as usual, $10, no charge being made for space, which is allotted according to the merit and description of goods to be shown.

Frech's Power Punching Press.

The annexed engravings represent a general view and detail of a new power punching press brought out by Mr. William Frech, 68 West Monroe street, Chicago, Ill. The principal feature of the machine is a new



New Power Punching Press.—Fig. 1.—General View.

slide arrangement, shown more clearly in Fig. 2. The upper end of the connecting-rod is solid, while the lower end is furnished with a flattened V thread, and works in a ball-and-socket joint. This joint is nicely fitted in the middle of the slide. In the ball and near the top a steel nut is inserted, which on its upper side has a number of slots milled in to receive a catch or lock. The nut is fitted on the threaded end of the connecting-rod, which passes through both nut and ball. By adjusting the slide and setting the die all that is required to do is to raise the lock and turn the nut to the right or left, according to the adjustment required. The simplicity of this adjusting device will be readily seen.

The frame of the press is strongly built, forming on its upper part a solid wall, opening toward the bed-plate, and so forming a

Fig. 2.—Detail of Slide and Connecting-Rod.

solid back, and at the same time an open-back press. This renders it very convenient to feed work through the press, or from and toward the operator, which in a good many instances is a great saving of material. A drawer for catching punchings is attached under the bed and rests on projections of the legs. The small hand-wheel in front of the machine serves to more easily set the dies while the fly-wheel is in motion. The clutch is also a new feature. The movement of the slide is usually 1-inch, but can be made 1¼ and 1½ inch, as may be required; the adjustment is 1¼-inch. The press is also provided with a steel socket having a 1¼-inch square shank and a ⅞ inch hole to receive the punch. The bed-plate will take in dies from ½ inch to 5 inches wide, and is very convenient for setting dies. The opening in the press is 5 x 8 inches, and any kind of a bed-plate can be attached for larger work.

This press does away with numberless inconvenient tools to operate and adjust it, and is built with a view to answer all purposes for light metal-work, can be run at a high speed and is especially adapted for the manufacture of hardware specialties, for lock manufacturers, clock and watch factories, sewing-machine attachments and novelties in general. The fly-wheel is 28 inches in diameter, 4-inch face, weighs 325 pounds and runs from 100 to 125 revolutions per minute. The weight of the whole machine is 1500 pounds. It is made in three different sizes.

The History of Natural Gas.

The forthcoming second volume of "The Mineral Resources of the United States," published by the Geological Survey, contains a valuable chapter, compiled mainly from notes furnished by Mr. W. S. Jasboe, of Pittsburgh, by Mr. Albert Williams, Jr., chief of the Division of Mining Statistics and Technology, to whom we are indebted for advance sheets of the work. From the chapter in question we quote the following:

The fact that an inflammable gas issues from certain springs and also from fissures in the earth has been recognized for a very long time, but the first recorded use of such gas for the purposes of illumination, &c., was at Fredonia, Chautauqua County, N. Y., in 1821. The gas was obtained from a spring on the north bank of Canadaway Creek, in the village. The spring was excavated to a slight extent, covered, and the gas conveyed to a small copper holder, and thence piped to a mill and several stores for illumination. The gas from this well, which was sufficient for 30 burners, was used alone until 1858, when another well was sunk in the northwestern part of the village. The new well consisted of a shaft 30 feet deep, 6 feet wide at the top, and 14 feet at the bottom, with two vertical borings, one 100 feet and the other 150 feet deep. In 1865 the Colburn well, 1250 feet deep, was added to the Fredonia supply, which at present amounts to 6000 cubic feet per day. After gas was found at Fredonia such occurrences were frequently noticed and sometimes used.

In 1823 Mr. John Klingensmith, Sr., while drilling for brine on Brush Creek, 4 miles from Greensburg, Pa., struck a crevice in which so much gas was found that it took fire and burned the cabin in which the men slept. Judge Campbell, of Westfield, N. Y., supplied the lighthouse at Barcelona, a small harbor on Lake Erie, from a spring of natural gas, by contract with the National Government until the lighthouse was abandoned in 1856. In 1827 it was proposed to supply the lighthouse at Dunkirk, N. Y, with gas from the Matteson spring at Fredonia, but the project was abandoned from difficulty in transporting the gas. The numerous borings for oil at Titusville, Pa., in 1859–60, yielded more or less gas as well as oil. Public notice was first directed to its quantity by the burning of the Rouse well, on Oil Creek, where a large number of lives were lost by the explosion of gas. It was then considered more of a nuisance than an article of value; little was used as fuel, and it was usually piped from the wells to a safe distance to dispose of it by burning. In 1867 two wells were bored near Rocky River, in the village of East Rockport, near Cleveland, Ohio, which have since that time supplied about 20 houses with light and partly with heat.

The use of waste gas from the Pennsylvania oil wells began in 1872 or 1873, in Butler County, when the Fairview well, 1 mile west of Petrolia, was connected by pipes with Fairview, Petrolia, Argyle and Karns City; in 1873 40 boilers, 8 pump stations on the lines, 200 gas burners and 40 cooking stoves were fed from this well. Many large wells have since been struck in Butler County. Prominent among them are the Burns well, on the Delphy farm, ¾ mile south of Saint Joe; the Delamater well, ½ mile from the former; the Harvey well, near Larden's Mills, Clinton Township; Saxon Station well, Winfield Township; these were bored in 1874 and are still valuable, the last mentioned supplying half of its village with heat, besides being utilized for the manufacture of lampblack. Since 1874 12 other wells have been bored in Butler County, and have been used in supplying the plant of Spang, Chalfant & Co., being piped 18 miles to their mills near Pittsburgh. In these mills gas is now used under 12 boilers, in 9 heating furnaces and in 28 puddling furnaces. Some of the oldest of these wells are still furnishing large amounts of gas; others failed after four to six years' use. Several other wells have been drilled in Butler County within the last two years, and the region is still being developed actively. In 1872 the gas from the Titusville oil region was led from Newton well, in Oil Creek Township, Crawford County, to Titusville and introduced into dwellings, refineries, &c. The flow decreased, however, until it finally was of no use. With the exception of this transient use in Crawford County the development of the gas industry in Pennsylvania followed a circular path, with Pittsburgh at its center.

From Butler County the discovery of gas wells extended to Kittanning, Armstrong County, in 1876. In 1880 a well was applied to the rolling mill of the Kittanning Iron Company. Developments at this place have been continued. In June, 1883, a second well was finished, adjoining the old one, and in September, 1884, a third was added to the supply of the rolling mill, where 36 puddling furnaces and 18 boilers consume, in all, perhaps 1,000,000 cubic feet of gas per hour. In 1878 an enormous volume of gas was found in a well on the Remaly farm, at Murraysville, Westmoreland County. In August, 1882, a second well was bored, and in April, 1883, another on Lyon's Run. The gas from these wells was piped to Pittsburgh by the Penn Fuel Company. The Fuel Gas Company finished two wells in the same region in 1883, and by consolidation all these wells were connected with Pittsburgh and began to supply that city with natural gas. In 1883 the Acme Gas Company drilled a well on the Remaly farm, but did not get enough gas to pay for piping it. Their next venture on Lyon's Run was more successful. According to Messrs. Boulton and Doubleday, of the Acme Company, several wells have been drilled as far as the gas sand, and only require a few hours' work to produce gas when it is needed. This company have an 8-inch wrought-iron pipe, 8 miles long, from their wells to the Edgar Thomson Steel Works (Carnegie Bros.), at Bessemer Station, on the Pennsylvania Railroad, and thence a 6-inch pipe to the Pittsburgh Bessemer Steel Company, at Homestead, on the south side of the Monongahela River. When the Edgar Thomson Works are running to the full capacity the gas consumed takes the place of 400 tons of coal per day. According to Capt. William R. Jones, the consumption of the Homestead Works is equivalent to 300 tons of coal per day. The Acme Company also supply one glass-house, the boilers at the Poor farm, and are now introducing pipes into Braddock for heating and lighting. According to Mr. Scott Verner, the Carpenter Natural Gas Company have increased the yield of Westmoreland County by a well on the Daum farm, in Penn Township, from which gas is piped to Pittsburgh and McKeesport. Mr. J. G. Beale reports that a well was bored at Leechburg, Armstrong County, in May, 1880, which was supplemented in 1882 by a well on the opposite side of the river. Both of these are controlled by the West Penn Steel Works, and either is sufficient for supplying the whole plant, taking the place of 1000 bushels of coal daily in one open hearth furnace of 10 tons capacity, one heating furnace and one hammer furnace. The town of Leechburg has a well supplying 300 or 400 fires, two grist mills and eight boilers, at an income of about $500 per month. The celebrated McGuigan well, 2 miles from the town of Hickory, began the development of the industry in Washington County. It was drilled for oil to the unusual depth of 2257 feet, in March, 1881. Since the inclination to substitute gas for coal has been fairly established in Pittsburgh this well has been furnishing gas to some of the manufactories on the Southside, to Weighman's glass-house and J. Painter's Sons & Co.'s rolling mill. In the last mill alone the gas will replace a daily consumption of 6500 bushels of coal when running to the full capacity. In 1884 the Emery and Miller wells were drilled in the Washington County region, and besides these three large wells the People's Light and Heat Company, of Washington, own two small wells used for heating and lighting that town.

During 1883 and 1884 the borings for gas wells were numerous and scattered over a large area. They have resulted in the location of two important fields—one in Pittsburgh itself, and the other the great Tarentum region, in Allegheny County. In regard to the latter, it should be said that its discovery was not an accidental consequence of boring for oil, but the result of continued effort to obtain natural gas. Mr. J. B. Ford, in seeking gas for a plate-glass factory to be erected at Creighton Station, on the Western Pennsylvania Railroad, drilled a well within 170 feet of what became the celebrated well of Graff, Bennett & Co., at Tarentum, but obtained nothing. His next venture was nearer the proposed glass-house, and was abandoned at 2309 feet. Not daunted by two failures, Mr. Ford succeeded in finding a good well on the farm of James Smith, on Big Bull Creek, back of Tarentum. Another good well was found on J. S. Coe's farm, East Deer Township, Allegheny County. These supply 2 400 horse-power engines, 14 double-cylinder engines of 20 horse-power each, 60 annealing ovens, furnaces melting 30 tons of glass daily, and 50 dwelling-houses. Since the Coe well the Pennsylvania Salt Mfg. Co. have drilled one small well, one dry well and one well equal to the Coe. Richards & Whiteley, glass manufacturers, have a large well which they bored in 1883. The Tarentum Light and Heat Company struck two good wells. Messrs. Guffey & Galey drilled two wells in this field, the first about equal to the Coe and the second one of the largest ever found. The latter has been sold to the Philadelphia company of George Westinghouse & Co., and is being piped to Pittsburgh. In September, 1883, another very large well was drilled on the Crist farm, about 1 mile from Tarentum. It is owned by capitalists who propose to utilize it for manufacturing. A number of other wells are drilling in this field. The immediate vicinity of Pittsburgh was considered a salt-water district, on account of the several large salt-water wells drilled by the salt manufacturers and by the record of the deep well drilled on Boyd's Hill. This well was begun early in 1876, and at a depth of 1588 feet a conglomerate was found supposed to be the upper Berea grit; from this depth to 1700 feet the same strata extended and produced an immense volume of salt water, 11° strong. The flow was estimated to be about 3000 to 4000 barrels per day. The well was drilled to 2300 feet, but no oil or gas was found in any quantity.

On May 29, 1884, Mr. Westinghouse struck an immense gas well on his premises at Homewood, inside of the limits at Pittsburgh. This well when first struck showed a pressure of 15 to 17 pounds when blowing freely from a 5⅝-inch pipe, but it began to diminish, and 21 days from the day it was struck it had lost 60 per cent. of its flow, and in October, 1884, it had settled down to an ordinary well. Its flow when first struck was estimated to be about 20,000,000 cubic feet per day. Westinghouse No. 1 was plugged with long wooden plugs at the gas horizon, so as to allow the well to be reamed out down to the gas. When the plug was drilled out, the force of the gas was so great that the plug, drill and all, weighing in the neighborhood of 3600 pounds, were blown from the well through and above the derrick. This strike started a perfect furore in gas drilling. A well was started on the Park Bros. & Co.'s lot, Thirty-first street; others at Moorhead & McClain's, Jones & Laughlins', Chess, Cook & Co.'s and Painter's mill. These all proved to be salt-water wells. The Fuel Gas Company's venture, about 1000 feet nearly due east from No. 1, proved to be a dry hole. Around Homestead many more wells were started. Mr. Westinghouse started Nos. 2, 3 and 4. The Penn Fuel Company obtained a small well, the Fuel Gas Company a dry hole, and Dillworth Bros. a small well. J. M. Guffey & Co. drilled a well about ½ mile northeast from Westinghouse No. 1, and got a very fair yield of gas. Several wells at Brushton Station were bored, but yielded little gas. A fair well was obtained by Mr. Howard Morton, on Four Mile Run, in October, 1884, at a depth of 1715 feet, but in attempting to increase the yield salt water was struck and ruined the well. This was also the history of two wells at Elrod's Station, Baltimore and Ohio Railroad. New wells are constantly being added to this Pittsburgh region.

Besides the local wells, the Butler County, Murraysville (Westmoreland County), Washington County and Tarantum regions supply gas for Pittsburgh. The greater part of this gas has been brought from the Murraysville district by the Penn Fuel Company's and the Fuel Gas Company's lines. The former have one 8-inch line and one 5⅝ inch line. The latter have two 5⅝ inch lines. These two companies have united, and are now laying a 10 inch line in addition to the four in use. This combination alone has supplied the following list of consumers; the list shows the number of puddling furnaces, boilers, leers, glory holes, brick kilns, &c.:

	No.
Boilers	168
Open-hearth furnaces	6
Crucible furnaces	10
Puddling furnaces	85
Heating furnaces	83
Sand furnaces	4
Hammer furnaces	10
Glass-melting furnaces	7
Glory holes	55
Leers	75
Other small furnaces	30
Bakers	3
Mufflers	2
Annealers	62
Core ovens	22
Japanning ovens	2
Calcining ovens	2
Brick kilns	59
Drying floors	4
Ladle burners	7
Blow furnaces	12
Flattening ovens	6
Bending furnaces	4
Lap-weld furnaces	2
Butt-weld furnaces	4

Although the sources given thus far represent the most important features of the industry, inasmuch as they supply Pittsburgh, the use of natural gas has lately been extended to several other districts, some of them far removed from Pennsylvania. In 1884 two wells drilled on Raccoon Creek, in Hopewell Township, Beaver County, were used to supply the towns of Philipsburg, Beaver, Rochester, New Brighton and Beaver Falls, and several other wells are to be drilled in the same locality. More than 60 wells have been drilled in and around Erie, Pa. The number of companies chartered to supply natural gas in Pennsylvania up to February 5, 1884, was 150, representing a capital stock of $2,160,580. Since that date a large number of new charters have been granted.

In West Virginia the Barclay well was bored expressly for gas near Wellsburg, and has been used for supplying that town with light and heat; it furnishes fuel for a paper mill, the water works, a machine shop and planing mill, a nail and rolling mill and some 250 dwellings, besides churches, halls, &c. Of six other wells in this district four are valuable. Across the river, at Brilliant, a similar well is also in use. At Moundsville, Marshall County, gas was found in the spring of 1883 by a party of Pittsburgh capitalists while drilling for oil. The well was ruined by boring deeper and striking salt water.

In Ohio gas wells have been known for 20 years or more at East Liverpool and New Cumberland. In 1884 they were applied to heating and lighting those towns. In Cleveland the Brush Electric Light Company are using gas from a private well, and the Cleveland Rolling Mill is boring one. The Jefferson Iron Works finished a well for their use at Steubenville in 1883. Crestline and Wooster also have gas wells, and gas companies have recently been formed in Toledo, Painesville, Findlay and Ashtabula. The Cincinnati Warehouse and Malting Company have discovered gas in a well bored for water to a depth of 256 feet. The company are preparing to use the gas for heating purposes and eventually for lighting the building. Natural gas is known in Kentucky near Louisville, near Warfield, in Martin County, and at Paducah; in Indiana at Vernon; in Southern Illinois at Metropolis, in Massac County; in Alabama near Village Creek; in Miami County, Kan., 6½ miles east of Paola (according to Mr. E. C. Wickersham, of the Paola Gas Company, this well is to be connected with Paola for illuminating purposes); at Mitchell, Davison County, Dak.; and near Stockton, San Joaquin Country, and in Los Angeles County, Cal. The following towns, among others, were using natural gas for domestic and manufacturing purposes at the close of 1884: New York—Olean, Wellsville, Bolivar, Richburg, Rochester, Cuba, Fredonia, and Gasport. Pennsylvania—Pittsburgh, Allegheny, Washington, Kitanning, Oil City, Titusville, Foxburg, Erie, Clarion, Parker, Bradford, Freeport, Butler, Tarport, Braddock, Tarentum, Manorsville, Creighton, Fairview, Petrolia, Argyle, Karns City, Warren, and McKeesport. West Virginia—Wellsburg. Ohio—Cleveland, East Liverpool, Steubenville and Wooster.

The Lock Stitch Fence Company gave two promissory notes to the Washburn & Moen Mfg. Co., payable to their order, but before they were delivered four persons indorsed them. The notes not being paid, suit was brought against the maker and these indorsers as joint makers, and judgment was given against all of the defendants as original promisors. In this case—First National Bank of Worcester *vs.* Lock Stitch Fence Company—in the United States Circuit Court for the Northern District of Illinois, Judge Dyer, in the opinion, said: "By the growing current of authority it seems to be considered that the liability assumed by a third party who has indorsed a negotiable promissory note before its delivery to the payee is that of an original maker, although in some of the States a different view was and is yet adhered to. In the Federal courts it is now settled that such indorsements bind the makers of them as original promisors. It is claimed in this case that, as the notes were made and delivered in Illinois, the law of the State must prevail; but in questions of general commercial law the Federal courts will not be bound by the State decisions."

Current Hardware Prices, August 26, 1885.

HARDWARE.

Anvils.
Eagle Anvils American.....₱ lb 10¢—dis 20 %
Wright's.....9¾ @ 10¢
Armitage's Mouse Hole.....9¢
Armitage Mouse Hole, Extra.....11½¢
Trenton.....9½¢
Wilkinson's.....9½¢@10¢
J. & Riley Carr, Patent Solid.....11@11½¢

Anvil Vise and Drill.
Millers Falls Co., $18.00.....dis 20 %
Cheney Anvil and Vise.....dis 25 %
Allen Combined Anvil and Vise, $2.50.....dis 40 %

Augers and Bits.
First Quality.....dis 60&10 @ 60&10&5 %
Snell's.....dis 60&10@60&10&5 %
Cook's, Douglass Mfg. Co.....dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip.....dis 60 %
Patent Solid Head.....dis 30 %
C. E. Jennings & Co., No. 5.....dis 40&10 %
C. E. Jennings & Co., No. 30.....dis 60&10 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₱ set, 32½ quarters, No 5, $6; No. 30, $3.....dis 20 %
Lewis' Patent Single Twist.....dis 45 %
Russell Jennings' Augers and Bits.....dis 25 %
Imitation Jennings Bits(new list).dis 50&10@50&10&5%
Car Bits, Snell Mfg. Co.....dis 40&10&10 %
Car Bits, New Haven Copper Co.....dis 50&10 %
L'Hommedieu Car Bits.....dis 15 %
Snell Mfg. Co.'s Jennings' Bits (new list).....dis 50@5 %
Expansive Bits, Clark's small,$18; l'ge,$26..dis 33⅓@35%
Expansive Bits, Ives' No. 4, per doz., $60.dis 35@35&5 %
Expansive Bits, Swan's.....dis 40 %
Expansive Bits, Ansonia.....dis 25 %
Expansive Bits, Steer's, No. 1, $26; No. 2, $22...dis 35 %
Hollow Augers, Ives' / Hollow Augers, French, Swift & Co.....dis 25&10 %
Hollow Augers, Douglass'.....
Hollow Augers, Bonney's Adjust. ₱ dz. $48...dis 40&10 %
Hollow Augers, Stearns' Adjust. ₱ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50.dis 45 @ 50 %
Hollow Augers, Univ'l Expan...each. $4.50.....dis 20 %
Wood's.....dis 25 %
Gimlet Bits.....₱ gross $3.00 @ $3.25
Gimlet Bits, Diamond.....₱ doz. $1.10, dis 25&10 %
Gimlet Bits, "Bee".....dis 25 %
Double Cut Gimlet Bits, Shepardson's.....dis 45 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co...dis 30&10 %
Double Cut Gimlet Bits, Hartwell's, ₱ gro, $6.50.dis 10 %
Double Cut Gimlet Bits, Douglass'.....dis 40 %
Double Cut Gimlet Bits, Ives'.....dis 50&10 %
Syracuse Twist Drill Bits.....dis 30 @ 30&5 %
Holtz Bit Stock Drills.....dis 25&10 %
L'Hommedieu's Ship Augers.....dis 15 @ 20 %
Watrous's Ship Augers.....dis 15 @ 20 %
Snell's Ship Augers.....dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits.....dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule.....$3.50 ₱ gross—dis 40&10 %
Patent Sewing, Short.....$1.00 ₱ doz—dis 40&10 %
Patent Sewing, Long.....$1.20 ₱ doz.—net
Patent Peg, Plain Top...$10.00 ₱ gross—dis 40&10&5 %
Patent Peg, Leather Top.$12.00 ₱ gross—dis 40&10&5 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....₱ gross $1.70—dis 35 %
Awls, Shouldered Peg.....₱ gross $2.45—dis 40 %
Awls, Patent Peg.....₱ gross 62¢—dis 40 %
Awls, Shouldered Brad.....$2.70 ₱ gross—dis 35 %
Awls, Handled Brad.....$7.50 ₱ gross—dis 45 %
Awls, Handled Scratch.....$7.50 ₱ gross—dis 35&10 %
Awls, socket Scratch.....$1.50 ₱ doz—dis 25 @ 30 %
Aiken's Sets, Awls & Tools...₱ doz. $10.00—dis 50&10 %
Millers Falls Adj. Tool Handles.....₱ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 1.....₱ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 2.....₱ doz $18—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. / Brad Sets, Stanley's Excelsior, No. 2, $4.00. / Brad Sets, Stanley's Excelsior, No. 3, $5.50. } dis 25&10 %

Axes.—Best grades, according to brand.
.....₱ doz $6.25 @ $7
Good Seconds.....$5.50 @ $6

Axle Grease.
Fraser's, in bulk.....Keg ₱ lb, 5¢; Pail, ₱ lb, 6¢ net
Fraser's, in boxes.....₱ gross $10.00 net

Axles.—Common.....₱ lb, 3½@3¾¢
Fine Axles, 1¼ in. and under .....dis 60&5 @ 60&10 %
Fine Axles, over 1¼ in.....4¾ @ 5¢ ₱ lb

Bag Holders.
Sprengle's Pat., ₱ doz $18. .....dis 60 %

Balances.
Spring Balances.....dis 40&10 %
Common 24lb.....₱ doz., $1.50—dis 40&10 @ 50 %

Bells.
Hand, Light Brass.....pis 75&10 @ 80 %
Hand, Extra Heavy.....dis 65 @ 65&10 %
Hand, White Metal .....dis 70 %
Hand, Silver Chime.....dis 25&10&5 %
Hand Globe (Cone's Patent).....dis 25&10 %
Gong, Abbe's.....dis 25&10 %
Gong, Yankee.....dis 40&10 %
Gong, Barton's.....dis 25&10 %
Crank, Taylor's.....dis 25&10 %
Crank, Brooks'.....dis 50&10&2 %
Crank, Cone's.....dis 10 %
Crank, Connel's.....dis 20&10 %
Lever, Sargent's.....dis 60&10 %
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....dis 25&10 %
Lever, R. E. M. Co.'s.....dis 50&10&2 %
Full, Brook's.....dis 50&10&2 %
Full, Western.....dis 25&10 %
Call.....dis 40@40&5 %
Cow, Common Wrought.....dis 60&10 @ 60&10&5 %
Cow, Western.....dis 20&10 %
Cow, Western, Sargent's list.....dis 70&10 %
Cow, Kentucky "Star".....dis 20&10 %
Cow, Kentucky, Sargent's list.....dis 70&10 %
Cow, Dodge, Genuine Kentucky, new list.....dis 70 %

Nos.	0	1	2	3	4	5	6	Hog
	$12.00	10.00	9.00	8.00	6 00	5.00	4.00	3.00 2.50 5.00

Cow, Texas Star.....dis 50@50&5 %
Farm Bells.....₱ lb, 31¢
Steel Alloy Church and School Bells.....dis 40 %

Bellows.
Blacksmiths'.....dis 50&10@50&10&5 %
Molders'.....dis 50 %
Hand Bellows.....dis 50 %

Belting, Rubber.
Standard.....dis 70&5 %
Extra.....dis 60&5@60&10&5 %
N. Y. Belting & Packing Co., Standard.....dis 60&5 %
N. Y. Belting & P'k'g Co., Extra Standard..dis 50&10 %
Cleveland Rubber Co., Extra Standard....dis 60&10 %

Bench Stops.—Hotchkiss's ...₱ doz $5.00—dis 10 %
Weston's, per doz No. 1, $10; No. 2, $9—dis 25&10 @ 25&10&5 %
McGill's.....₱ doz $3—dis 10 %
Morrill's.....₱ doz $7.50—dis 40&5@40&10 %

Bit Holders.
Extension, Barber's.....₱ doz $15.00—dis 40&5 %
Extension, Ives'..₱ doz $20.00—dis 40&10 @ 40&10&5 %
Diagonal.....₱ doz $24.00—dis 40 %
Angular.....₱ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic.....₱ per doz $3.00—dis 30 %
Excelsior.....₱ doz $10.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's.....₱ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern.....$15 ₱ gro.—dis 50&10 %
Van Sand's Old Pattern.....$15 ₱ gro.—dis 50&10 %
Washburn's Old Pattern.....₱ ₱ gro. net
Merriman s.....new list, net
Salisbury & Austin No. 2008.....₱ ₱ gro. net
Security Gravity.....₱ ₱ gro. net

Blind Staples.
Barbed, ⅛ in. and larger.....₱ ₱ 8 @ 8¼¢ net
Barbed, ⅛ in.....₱ ₱ 8 @ 9½¢ net

Blocks.
Tackle Blocks, &c. list April 17, 1885.....dis 20 %
Reed Mfg. Co. Self-Lubricating.....dis 50 %

Bolts
Cast Iron Barrel, Square, &c.....dis 70 @ 70&5 %
Cast Iron Shutter Bolts.....dis 70 @ 70&5 %
Cast Iron Chain (Sargent's list).....dis 70 @ 70&5 %
Ives' Patent Door Bolts.....dis 55&10 %
Wrought Barrel.....dis 70 @ 70&5 %
Wrought Square.....dis 70 @ 70&5 %
Wr't Shutter, all Iron, Stanley's list..dis 50&10&2&5 %
Wr't Shutter, Brass Knob, Stanley's..dis 25&10&10&5 %
Wrought Shutter, Sargent's list.....dis 60&10&5 %
Wrought Sunk Flush, Sargent's list.....dis 60&10&5 %
Wrought Sunk Flush, Stanley's list.....dis 40&10&5 %
Wrought B. K. Flush, Com'n Stanley's list.....dis 55 %
Tire, Common, list Feb. 28,1883.....dis 70&5 @ 70&10 %
Carriage, Com., list June 10, '84.....dis 80 @ 80&10 %
Carriage, Genuine Eagle,list Oct.7,'84..dis 75&5@75&10%
Carriage, Phila. pattern, list Oct. 7,'84..dis 75&10@80 %
K. B. & W., Carriage, old list.....dis 70&5 %
Fire, Am. S. Co., Norway, Ph'l., list Oct. 16, '84..dis 82½&5 %
Fire, Am. S. Co., Eagle, Ph'l., list Oct. 16, '84..dis 82½&5 %
Tire, Am. S. Co., Bay State, list Feb. 28,'83.....dis 70 %
Tire, K. B. & W., Philadel. list Oct. 16, 1884..dis 80&5 %
Stove.....dis 70 %
Plow.....dis 65 %
Plow, R. B. & W.....dis 50&5 %
Machine.....dis 80 %
Bolt Ends.....dis 80 %

Borax.
.....9¢ @ 9½¢ ₱ lb net

Boring Machines.

	Without Augers.	Upright.	Angular.
Douglas		$5.50	$6.75.....dis 50 %
Snell's, Rice's Patent.....		5.50	6.75.dis 40&10&5 %
Jennings		5.50	6.75..dis45@45&10%
Other Machines		2.50	3.00.....net
Phillips' Pat., with Augers		7.00	7.50.....net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos..dis 70 @ 70&10 %
Sargent & Co.'s.....$17 and $18, dis 60&10 %
Peck Stow & W. Co.....dis 50&10 @ 50&10&5 %

Braces.
Q. S. Backus.....dis 50&10 @ 50&10&10 %
Barber's, Nos. 10 to 16.....dis 50 %
Barber's, Nos. 30 to 33.....dis 40&10 %
Barber's, Nos. 40 to 63.....dis 40&10&5@50 %
Spofford's.....dis 50&10 @ 50&10&10 %
Ives' Patent Braces.....dis 60@60&5 %
Common Ball, American.....dis 55&10 %
Bartholomew's, Nos. 25, 27, 30...dis 50&5 @ 50&10&5 %
Bartholomew's, Nos. 117, 118, 119.....dis 65 %
Amidon's Barker's Imp'd.....dis 60@60&10&5 %
Amidon's Corner Brace.....dis 40 @ 40&5 %
Universal.....8 in., $1.90 : 10 in., $2.10
Buffalo Ball.....8 in., $1.50 @ $1.55

Brackets.
Shelf, plain, Sargent's list.....dis 60&10 %
Shelf, fancy, Sargent's list.....dis 60&10&10 %
Reading, plain.....dis 60&10&5 %
Reading, Rosette.....dis 66⅔&10 %

Bright Wire Goods
List of June 25, 1883...dis 70&10&10 @ 70&10&10&10 %

Broilers.—Henis' Self-Basting.

Inch	9	10	9 x 11
Per doz	$4.50	5.50	6.50

Buckets, Galvanized.

Quarts	10	12	14
Hill's Light Weight, ₱ doz	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ doz	3.00	3.25	3.75

Bull Rings.
Union Nut Co.....dis 55 %
Sargent's.....dis 66⅔&10 %
Hotchkiss' low list.....dis 30 %
Humason, Beckley & Co.'s.....dis 70&10 %
Peck, Stow & W. Co.'s.....dis 50&10 %
Ellrich Hdw. Co., White Metal, low list.....dis 50 %

Butts.
Wrought Brass.....dis 70 @ 75 %
Cast Brass, Tiebout's.....dis 40 %
Cast Brass, Corbin's F. Joint.dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint.....dis 33⅓&10@33⅓&10&10 %
Fast Joint, Narrow.....dis 60&10 %
Fast Joint, Broad.....dis 60&10 %
Loose Joint. / Loose Joint, Japanned. / Loose Joint, Jap. with Acorns. / Parliament Butts. / Mayer's Hinges. / Loose Pin, Acorns. / Loose Pin, Acorns, Japanned. / Loose Pin, Acorns, Jap. Pltd. Tips. } dis 70&10@70 &10&5 %
WROUGHT IRON.
Fast Joint Narrow.....dis 60&10&10 %
Fast Joint, Lt. Narrow.....dis 60&10&10 %
Fast Joint, Broad.....dis 60&10&10 %
Loose Joint, Broad.....dis 60&10&10&5 %
Table Butts, Back Flaps, &c.....dis 60&10&10 %
Inside Blind, Regular.....dis 60&10&10 %
Inside Blind, Light.....dis 60&10&10 %
Loose Pin, Wrt.....dis 60&10&10&5 %
Loose Pin, Light.....dis 60&10&10 %
Bronzed Wrought Butts.....dis 45&5@45&10 %
Spring Hinges:
Geer's Spring and Blank Butts.....dis 33⅓ %
Union Spring Hinge Co.'s.....dis 30 %
American Spring Hinge Co.'s.....dis 30 %
Gem Spring Hinges.....dis 30 %
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 25 %
Buckman's.....dis 25 %
Empire.....dis 60&10 %
Acme.....dis 70 %
Climax.....dis 50&10 %
Chicago.....dis 30 @ 30&10 %
Blind Butts, Parker.....dis 75&2 %
Blind Butts, Palmer.....dis 50&5&10 %
Blind Butts, Seymour.....dis 70&2 %
Blind Butts, Lull & Porter.....dis 80&10 %
Blind Butts, Nicholson.....dis 45&10 %
Blind Butts, Huffer.....dis 50 %
Blind Butts, Clark's, Nos. 1, 3, 5.....dis 80 %
Blind Butts, Manhattan Hardware Co.....dis
Blind Butts, Sargent's, Nos. 1, 3.....dis 75&10 %
Blind Butts, Sargent's, No. 12.....dis 75&10&10 %
Blind Butts, Reading's Gravity.....dis 75&10 %
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55.....dis 75&10&5 @ 80 %
Blind Butts, Shepard's Champion Gravity, No. 75.....dis 80&10 %
Blind Butts, Shepard's "Gravity," Nos. 1, 3 and 5.....dis 80 @ 80&5 %
North's Automatic Blind Fixtures, No. 2, for Wood, ₱ No. 3, for Brick, $10.50.
Shepard's "O. S." and "Acme" Lull & Porter.....dis 75&10&5 %
Shepard's "Queen City" Reversible....dis 75&10&5 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3.....d's 70 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co.....dis 30&5 @ 30&10 %
Bradley's.....dis 25 @ 30 %
Beatty's.....dis 33⅓&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s.....dis 40 %
Albertson Mfg. Co.....dis 33⅓ @ 33⅓&5 %

Calipers.....See Compasses

Can Openers.
Messenger's Comet.....₱ doz $3.00, dis 25 %
American.....₱ gross $3.00
Duplex.....₱ doz 25¢, dis 15 @ 20 %
Lyman's.....₱ doz $3.75, dis 20 %
No. 4. French.....₱ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle.....₱ gross $6.00, dis 45 @ 50 %
Eureka.....₱ doz $2.50, dis 10 %
Sardine Scissors.....₱ doz $7.00, dis 55 %
Star.....₱ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50, dis 50&10 %
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....dis 50&10 %
Universal.....₱ doz $3.00, dis 35&5 %
Domestic.....₱ doz $2.50, dis 45 %
Champion.....₱ doz $2.00, dis 50 %

Caps—Percussion. ₱ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's.....50¢ / E. B. Trimmed Edge, 1-10's.....65¢ / E. B. Ground Edge,Central Fire,1-10's.70¢ / Double Waterproof, 1-10's.....$1.40 } dis 25 @ 25&5 %
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B.....30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56¢
Eley's D Waterproof, Central Fire.....$1.60
U. M. C., F. C. Trimmed.....50¢ / U. M. C., F. L. Ground.....65¢ / U. M. C., Cen. Fire Ground.....70¢ / U. M. C., Double Waterproof.....$1.40 / Double Waterproof, in 1-10's.....1.40 } dis 25 @ 25&5 %

Cartridges.
Rim. list Jan. 1, '84.....dis 60&10&2 @ — %
Central Fire, list Jan. 1, '84.....dis 40&10&2 @ — %

Cards
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool....." " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₱ doz $5.00, dis 30 %
Cast Iron, Steel Points.....₱ doz $1.00, dis 15 %
Socket.....₱ doz $2.50, dis 25 %
Bullard's.....dis 25 %

Carpet Sweepers.
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell No. 12 Hall Sweeper.....₱ doz $42.00
Mystic.....₱ doz $17.00
Cottage.....₱ doz $15.00
Garland.....₱ doz $19.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00

Casters.
Bed. / Plate. / Shallow Socket. / Deep Socket. } dis 60&5@ 60&10 %
.....dis 45 @ 50 %
Yale Casters, reduced list May, 1884...dis 25@25&10 %
Martin's Patent (Phoenix).....dis 45&10 @ 50 %
Payson's Anti friction.....dis 60 %
"Giant" Truck Casters.....dis 10 %
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 75 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck, Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6¼-10-2 Exact....₱ pair 79¢ / Trace, 6¼-10-3 Exact....₱ pair 70¢ / Trace, 7-10-2 Exact.....₱ pair 86¢ } dis 50&10 @ 60 %
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 60 %
German Halter Chain, list of June, 1884.....dis 55&5 %
German Coll. list of June, 1881.....dis 55&5 %
American Coil.....

	3-16	¼	5-16	⅜	7-16	½
	$0.8	.06	.05¼	04½	.04½	.04¼

Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35&2 %
Meneely's Breast, Halter and Hitching.....dis 50&10 %
Meneely's Pat. Sleeve-Snap Breast.....dis 50&10
Oneida Halter Chain (old list).....dis 45 %
Coal and Tramel Pump Chain.....₱ lb 5½¢ @ 6¼¢
Jack Chain, Iron.....dis 75 %
Jack Chain, Brass.....dis 70&10 %

Chalk.
White.....₱ gro 55¢
Red.....₱ gro 65¢
Blue.....₱ gro 90¢
White Crayons.....₱ gro 12¢ @ 13¢

Chalk Lines.—See Lines.

Cherry Seeders.....₱ doz $3.50

Chisels.
Socket Framing and Firmer.....dis 80 %
Douglass & Witherby.....dis 75 @ 75&5 %
Socket Framing and Firmer, Buck Bros.....dis 30 %
Socket Framing and Firmer, Merrill.....dis 60&10&10 %
Socket Firmer, Framing, &c., L. & I. J. White..dis 25&5 %
Socket Framing Firmer, &c., Crossman.....dis 65&5 %
Tanged Firmers.....dis 50 @ 50&5 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to £
Tanged Firmers, Buck Bros.....dis 30 %

Clamps.
Iron, Providence Tool Co.'s Wrought Iron.....dis 25 %
Iron, Adjustable, Gray's.....dis 20 %
Iron, Adjustable, Lambert's.....dis 20 %
Iron, Adjustable, Snow's.....dis 40&5 %
Iron, Adjustable, Hammer's.....dis 15 %
Iron, Adjustable, Stearns'.....dis 20&10 %
Iron, Cabinet, Sargent's.....dis 70&10 %
Iron, Carriage Makers', Sargent's.....dis 65&10&10 %
Iron, Ebernard Mfg. Co.....dis 40&5 @ 40&10 %
Iron, Warner's.....dis 40&10 %
Saw Clamps.....See Vises

Coal Vases.
Buffalo Palace, S. S. & Co.....dis 33⅓&10 %
Buffalo Common, S. S. & Co.....dis 33⅓&10 %

Cockeyes.....dis 50 %

Cocks, Brass.
Racking.....dis 65&5 %
Globe.....dis 65&5 %
Plain Bibbs.....dis 60&5 %
Ale and Beer.....dis 60&5 %

Coffee Mills.
Board and Box.....dis 40&10&2 @ 45&10&2 %
Selsor's Patent.....$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co.....dis 20&10 %
The "Swift," Lane Bros.....dis 20&10 %
Webb's Patent.....dis 45 %

Compasses, Dividers, &c.
Compasses.....dis 60&10&10 %
Calipers.....dis 60&10&10 %
Dividers.....dis 60&10&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
Cook's Extension.....dis 25 %
J. Stevens & Co.'s Calipers and Dividers....d's 25&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
John Beatty & Co.....dis 33⅓ %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.
Grain.....dis 40&5&2 %

Crow Bars.
Cast Steel.....₱ lb 3½@3¾¢
Iron, Steel Points.....₱ lb 2½@3¢

Curry Combs.
Fitch's.....dis 50&10 %
Rubber.....₱ doz $10.00, dis 25 @ 30 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Goodel Co., Table.....dis 40 %
Wostenholme.....$7.75 @ $8.00 to £

Dividers.
Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₱ doz $1.45 @ $1.50
Gray's.....₱ gro, $20.00, dis 20 %
Bee Rod.....₱ gro, $20.00, dis 20 %
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30....dis 40&10 %
Gem (Coil):
No. 1, Large Japanned.....₱ doz $4.00)
No. 2, Medium, Japanned...₱ doz 2.75 } dis 50&10 %
No. 3, Small, Japanned.....₱ doz 2.00)
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ₱ doz $1.50)
No. 5, Screen Door size.....₱ doz 2.00 } dis
No. 6, Medium.....₱ doz 2.75 } 60 %
No. 7, Large.....₱ doz 4.00)
Victor (Coil).....dis 50&10&10 %
Champion (Coil).....dis 50&10 @ 50&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 50 %
Cowell's.....No. 1, ₱ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₱ doz $2.25, dis 20&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 %

Drawing Knives.
Douglass & Witherby.....dis 80 %
Merrill.....dis 75 @ 75&5 %
Watrous.....dis 60&10&10 %
L. & I. J. White.....dis 15&10 %
Bradley's.....dis 20&5 %
Adjustable Handle.....dis 35 %
.....dis 20@20&5 %

Drills and Drill Stocks.
Blacksmiths'.....each, $1.60 @ $1.70
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's.....each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20 %
Ratchet, Moore's Triple Action.....dis 25@30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 10 %
Automatic Boring Tools.....each, $1.75 @ $1.85

Drill Chucks.
Morse's Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $8.00, dis 30 @ 30&5 %

Dripping Pans.
Buffalo, S. S. & Co.....₱ lb, 5½¢

Egg Beaters.
Dover.....₱ doz., $2.50; ₱ gro., $27.00
National.....₱ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₱ gro, $17.00@$18.00
Standard.....₱ gro, $12.00
Kingston.....₱ gro, $9.00
Acme.....₱ gro, $8.00
Triumph (T. & S. Mfg. Co.).....₱ gro, $10.50@$11.50
Advance No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00

Emery.
Regular numbers.....₱ lb 7¢
Flour of F. F.....₱ lb 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron.....dis 50&10 %
Brass.....dis 60 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 33⅓&10 %
West's Patent Key.....dis 50 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
Self-Measuring, Enterprise...₱ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₱ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₱ doz $36.00—dis 25&10 %

Felloe Plates......₱ ₱ 6½¢ net

Files.
J. & Riley Carr.....New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....New list. dis 15 %
Butcher.....New list. dis 20 %
Best Files of domestic make, according to brand.....dis 60 @ 60&10&5 %
Lower Grade domestic Files.....dis 60&10&10 @ — %
New Am. File Co., Pat. Tapers.....dis 50 %
J. B. Smith Co. Screw Tang Files.....dis 60 %
J. B. Smith Co. Horse and Wood Rasps.....dis 50&10 %
Stubs.....dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls.....$3.25 each / Knox, 6-inch Rolls.....$3.60 each } dis 35 %
Eagle, 3¼-inch Roll.....$2.15, dis 35 %
Eagle, 5½-inch Roll.....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₱ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ₱ doz.....dis 30 %
Shepard Hand Fluter, No. 85.....₱ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₱ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₱ doz $8, dis 40 %
Clark's Hand Fluter.....₱ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...₱ doz $15.00, dis 30 %
Buffalo.....₱ doz $10.00 dis 10 %

Fluting Scissors.....dis 45 %

Fly Traps.
Paragon.....₱ doz $2.00

Forks.
Hay, Manure and Spading, first quality ....dis 60&10 %
Plated, see Spoons.

Freezers.—See Ice-Cream Freezers.

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %

Fry Pans.
Central Stamping Co.'s list.....dis 33⅓&2 %

No	0	1	2	3	4	5	6	7	8
₱ doz	$1.50	1.75	2.00	2.25	2.50	2.75	3.25	3.75	4.25

S. S. & Co.....dis 33⅓&2 %
"Acme".....dis 60 %

Gauges.
Marking.....dis 60&10 %
Wire.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %

Gimlets.
Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....dis 40&10 %
Double Cut, Shepardson's.....dis 45 %
Double Cut, Ives'.....dis 50 %
Double Cut, Douglass'.....dis 40 %
"Bee".....₱ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled.....dis 40&5@40&10 %
Family, Howe's "Eureka".....dis 40 %
Family, L. F. & C.'s "Handy".....dis 45 %

Grindstone Fixtures.
Sargent's Patent.....dis 70&10&10 %
Reading Hardware Co.....dis 35&10 %

Gun Wads.
U. M. C. & W. R. A.—B. E., 11 up.....$1.60 / U. M. C. & W. R. A.—B. E., 9&10.....1.85 / U. M. C. & W. R. A.—B. E., 7&8.....2.10 / U. M. C. & W. R. A.—P. E., 11 up.....2.50 / U. M. C. & W. R. A.—P. E., 9&10.....3.20 / U. M. C. & W. R. A.—P. E., 7&8.....4.00 } ..dis 10 %
Eley's B. E., 11 up.....1.75
Eley's P. E., 11 @ 20.....2.80

Hack Saws.
Griffin's Hack Saws, complete.....dis 40&10 %
Griffin's Hack Saw, Blades only.....dis 40&10 %
Star Hack Saws and Blades.....dis 25 %

Halters.—Covert's Pat. ½ Jute.....dis 50&10 %
Covert's Hemp Horse and Cattle Ties.....dis 50&10 %
Covert's Jute Horse and Cattle Ties.....dis 60 %
Meneely's Pat. Adjustable Hemp and Jute..dis 50&10 %
Meneely's Hemp and Jute Horse and Cattle Ties.....dis 50&10 %

Hammers—Maydole's.....dis 15&10 %
Cheney's, new list, March, 1883.....dis 20&10 %
Hartford Hammer Co.'s Nail Ham's..dis 25&5@25&10 %
Buffalo Hammer Co.....dis 40&10 %
C. Hammond & Son.....dis 15 @ 25 %
Humason & Beckley.....dis 5 %
Verree.....
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75..dis 25&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 10 %
Yerkes & Plumb, A. E. Nail.....dis 40&10 %
Wilkinson's Smiths'.....10½¢ @ 11¢ ₱ lb
Heavy Hammers and Sledges.....dis 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₱ doz...dis 10%
Providence Tool Co., Leg Irons, $25.00 ₱ doz.....dis 10 %
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₱ doz, $48; Nickeled, $57; 3 Hands, Polished, ₱ doz, $72; Nickeled, $84.....dis 20 %

Handles.—Door or Thumb Latches.

| Nos. | 0 | 1 | 2 | 3

Lustro.
Four-ounce bottles .....₩ doz., $1.75 ; ₩ gro. $17.00 net

Mallets.
Hickory.....dis 10&10&5 %
Lignumvitæ.....dis 10&10&5 %
Penfield Block Co., Lignumvitæ and Hickory..dis 30 %

Mattocks.
Regular list.....dis 60&10@60&10&5 %

Meat Cutters.
Dixon's (P. S. & W.) Nos 1 2 3 4
₩ doz..$14.00 17.00 19.00 30.00—dis 45 %
Miles' Challenge.....Nos. 1 2 3
₩ doz..$22.00 30.00 40.00—dis 45 %
Woodruff's (P. S. & W.).....Nos. 100 150
₩ doz. $15.00 18.00—dis 45 %
Hales'..... Nos. 11 12 13
₩ doz...$27.00 33.00 50.00 { dis 60&10&2@ 60&10&10&2 %
Draw Cut..Nos. 5 2 6 8 10
Each..$50.00 75.00 80.00 225.00 400.00—dis 20 %
American.....dis 35 %
Nos..... 1 2 3 4 5
Each.....$5.00 7.00 10.00 25.00 50.00 60.00
Enterprise.....dis 25@20&10 %
Nos. 10 12 22 32 42
Each..... $3.00 2.50 4.00 6.00 10.00
Kleser's No. 55.....$40 ₩ doz, dis 40 @ 40&5 %
Kleser's Gem.....$25 ₩ doz, dis 40 @ 40&5 %
Kleser's Monarch.....$45 ₩ doz, dis 40 @ 40&5 %
Kleser's Butcher.....$40 each, dis 20 @ 2-5 %
Pennsylvania.....dis 40&10 %
Nos..... 1 2 3 00
₩ doz..... $24.00 28.00 36.00 28.00
Beef Shavers Enterprise Mfg. Co.).....dis 20&10
Chadborn's Smoked Beef Cutter.....₩ doz, $60.00

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....Net
Lothrop's.....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40&45 %
Cowles Hdw. Co.....dis 60 %

Molasses Gates.—Stebbins' Pat's..dis 75&10@80 %
Stebbins' Genuine.....dis 75 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 70&10 %
Weed's.....dis 20&10 %
Hoss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00..₩ doz, dis 60&10&10 %

Money Drawers.—₩ doz..$18.

Nails.....See Trade Report
Wire Nails.....dis 50&10 @ 50&10&5 %
Wire Carpet Nails.....See Tacks

Nail Puller.
Curtiss Hammer.....₩ doz $9.00 net
Giant, No. 1.....₩ doz $30.00, dis 10 %

Nuts and Washers.
In lots less than 100 ℔, ₩ ℔ add ½¢ to list 1 ℔ boxes, 1¢ to list.
Square Nuts.....9½¢ off list
Hexagon.....10½¢ off list
Washers.....9½¢ @ 10¢ off list

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Oakum.
Government.....₩ ℔ 7¼@7½¢
U. S. Navy.....₩ ℔ 6¾@7 ¢
Navy.....₩ ℔ 5¾@6 ¢

Oilers.
Zinc and Tin.....dis 60&10&5 %
Brass and Copper.....dis 50&10 %
Malleable (Hammer's), No 1, $3.00; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 %
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co.....dis 50 @ 50&10 %
American Packing.....11¢
Russia Packing.....14¢
Italian Packing.....16¢
Cotton Packing.....15 @ 18¢

Peach Parers.
Rotary Knife.....₩ doz $15, dis 10 %
Diamond State.....₩ doz $15, dis 10 %

Pencils.
Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Lumber.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12.dis60&10@60&10&5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.dis60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list..dis 50&10 @ 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Niles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Planes and Plane Irons.
Bench, First Quality.....dis 20&2 %
Bench, Second Quality....dis 25&2 %
Molding.....dis 15&2 %
} Small extras sometimes given by jobbers
Bailey's Stanley R. & L. Co.).....dis 20&10 %
The Stanley (S. R. & L. Co.).....dis 20&10 %
Bailey's "Victor".....dis 20&10 %
Steer's Iron Planes.....dis 35 %
Meriden Mal. Iron Co.'s Iron Planes.....dis 20&10 %
Davis's Iron Planes.....dis 20&10 %
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....$5.00 to £
Plane Irons, The Globe Mfg. Co., "Baldwin Iron".....dis 33⅓ %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 33⅓ @ 30&10 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....dis 20&10 %
Humason & Beckley Mfg. Co .....dis 50 %
Gas Pliers.....dis 60 %
Eureka Pliers and Nippers .....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %

Plumbs and Levels.
Standard List.....dis 70&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10 %
Davis' Inclinometers.....dis 10&10 %

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₩ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $18 @ $20
Leed's.....₩ doz $9.50 @ $10.50
Vaughan's Hollow Tube Post Hole.....per doz, $24.00.....dis 33⅓ @ 20&10&10 %
Kohler's Little Giant.....₩ doz $24
Kohler's Hercules.....₩ doz $21.00
Schneidler.....₩ doz $24, dis 2 % cash
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....₩ doz $72, dis 50&5 @ 50&10 %

Potato Parers.
White Mountain.....₩ doz $5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $18.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....dis 40 %
Pruning Shears.....₩ doz $5.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %
J. Mallinson & Co., A. & B. Co. list.....dis 33⅓ %

Pulleys.
Hot House, Awning, &c.....dis 66⅔&10 %
Japanned Screw.....dis 66⅔&10 %
Brass Screw.....dis 7½10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ; } dis 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70...dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 20 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.
Cistern, Best Makers.....dis 50 %
Pitcher Spout, Best Makers.....dis 60 %
Pitcher Spout, Cheaper Goods .....dis 70 @ 70&25 %

Punches.
Saddlers' or Drive, good quality.....₩ doz $0.75
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality .....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 20&2 %

Rail.
Sliding Door, Wrought Brass ₩ ℔ 35¢,dis 20&25 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door, Painted....₩ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ¼ ⅜ ½
Per 100 feet..... $2.50 3.00 4.40—dis 10 %
S. D. for N. E. Hangers—
Small. Med. Large
Per 100 feet..... $2.15 2.70 3.25 net
Terry's Wrought Iron, 5¢ ₩ foot.....net
Victor Track Rail, 7¢ ₩ foot.....dis 50&2 %

Rakes.
Cast Steel.....dis 60&10 %
Malleable.....dis 60&10 @ 60&10&5 %

Razors.
J. R. Torrey Razor Co.....dis 20 %
Wostenholme & Butcher.....$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&10 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2

Rivets.
Black and Tinned Iron, Flat Head M Rivets (in packages and in bulk).....
Block and Carriage (in C packages).....
Iron Rivets (other than above) in bulk.....
Black and Tinned Burrs.....
} dis 50 %
} dis 45 %
Copper Rivets and Burrs.....dis 60 @ 60&5 %
Nos. 7 8 9 10 11 12 13 14 15
₩ ℔ .49¢ 50¢ 52¢ 54¢ 56¢ 58¢ 60¢ 65¢ 70¢

Rivet Sets......dis 50&2 %

Rods.—Stair, Brass.....dis 25&5 %
Stair Black Walnut.....₩ doz 50¢

Rollers.—Barn Door, Sargent's list..dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.
Mnf'rs list, July 1, 1885.
Manila.....⅝ inch and larger ₩ ℔ 13½¢
Manila.....⅜ inch ₩ ℔ 14 ¢
Manila.....¼ and 5-16 inch ₩ ℔ 14½¢
Manila Tarred Rope.....₩ ℔ 13 ¢
Manila, Hay Rope.....₩ ℔ 13½¢
Sisal.....⅝ inch and larger ₩ ℔ 8½¢
Sisal.....⅜ inch ₩ ℔ 9 ¢
Sisal.....¼ and 5-16 inch ₩ ℔ 9½¢
Sisal, Hay Rope.....₩ ℔ 8½¢
} Dis 12½ ₩ ℔.
Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢

Rules.—Boxwood.....dis 80&10 %
Ivory.....dis 55 @ 55&10 %
Stephens' Ivory.....dis 50 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.25 @ $2.50
Self Heating.....₩ doz. $9.00 net
Self-Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Double Pointed.....dis 35 @ 40 %
Mrs. Pott's Irons, Square Back.....dis 35 @ 40 %
Enterprise Star Irons, new list, July 20, 1882....dis 35 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.).....8½¢, dis 15 %
New England.....5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint, 00 to 1½..$4.50 ₩ ream
Baeder & Adamson's Flint, 2, 2½ & 3...5.00 ₩ ream
Baeder & Adamson's Flint, assorted..4.75 ₩ ream
Baeder & Adamson's Star. .....3.75 ₩ ream
Bartles Best Flint, Nos. 00 to 1½.....₩ ream $4.50
Bartles Best Flint, assorted.....₩ ream 4.50
Bartles Best Flint, Nos. 2 to 3.....₩ ream 5.00
Bartles Best Flint, No. 3½.....₩ ream 5.50
Columbia Flint, all Nos.....₩ ream 4.00
Madison Mills Flint, all Nos.....₩ ream 3.50
} dis 40@40&5 %
Emery Paper, 00 to 1½, $6.50; 2, $7.50; 2½, $9.50 .....dis 40 @ 40&5 %
Emery Cloth, B. A. & Co., 00 to 1½, $18; 2, $20; 2½, $24.....dis 40 @ 40&5 %
Emery or Crocus Cloth, Sibley, 9x12 in., $16.00; } dis 20 %
Emery or Crocus Cloth, Sibley, 7x9 in., $10.50 }
New England, same list as B. & A. Flint.....dis 35&10 %
Sand Paper without brand.....₩ ream, $2.10 net

Sash Cord.
Common.....₩ ℔. 12½¢ @ 13¢ net
Patent.....₩ ℔. 15¢ @ 16¢ net
White Cotton Braided.....₩ ℔ 32¢ @ 33¢
Common Russia Sash.....₩ ℔ 14¢
Patent " " " 18¢
Cable Laid Italian " " " 26¢
India Cable Laid " " " 14¢
Silver Lake, A Quality, White.....50¢, dis 10&10 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10 %
Silver Lake, B Quality, White..50¢, dis 10&10&10&30 %
Silver Lake, B Quality, Drab....55¢, dis 10&10&10&30 %
Silver Lake, C Quality, White (only).....20¢ @ 30¢
Spring Lake, A Quality.....50 @ 55¢, dis 10&10&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris.....dis 50&10 %
Morris' Triumph (revised list).....dis 60 %
Walker's.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Hammond's Window Springs.....dis 40 %
Common Sense, Japanned, Coppered and Bronzed.....₩ gross
Common Sense, Nickel Plated. .....₩ gross $12.00 net
Universal.....dis 30 %
Kempshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy.....dis 60&5@60&10 %
Payson's Perfect.....dis 50&10 &5%
Hugunin's New and Improved Adjustable Sash Balances, list March, 1885.....dis 33⅓ %
Hugunin's New Sash Locks, list March, 1885..dis 33⅓ %
Stoddard "Practical".....dis 10 %

Sash Weights.
Solid Eyes, in ton lots.....₩ ton, $19

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ doz. $20, dis 45 %
Perry.....₩ doz. No. 1, $15 : No. 0, $21 dis 45 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 25@20&10 %
Silver's.....dis 25 %

Saws
Disston's Circular, Mill and Cross Cut.....dis 45&10 %
Disston's Hand, Panel, Rip, &c.....dis 20&10 %
Atkins' Silver Steel Circular.....dis 40 %
Atkins' Selected Steel Circular.....dis 50 %
Atkins' Concaved Tooth Dexter X Cuts....₩ foot 55 ¢
Atkins' C. S. X Cuts, Regular.....₩ foot 34 ¢
Atkins' Hollow Back X Cuts.....₩ foot 22 ¢
Wheeler, Madden & Clemson Mfg. Co.'s Hand.....dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular.....₩ foot 36¢
W. M. & C. X Cuts, Thin Back.....₩ foot 29¢
Simond's Circular.....dis 35 %
Simond's Crescent-Ground Cross Cuts, patent December 23, 1882.....dis 25 %
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip.....dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 28¢
Peace Band Saws, all widths.....dis 20&10 %
Richardson's Circular.....dis 45 %
Richardson's Mill.....dis 45 %
Richardson's Cross-Cuts, No. 1, 30¢: No. 2, 27¢; No. 3, 25¢.
Richardson's Hand Panel, Butcher and Web Saws.....dis 25&5 %
Barry's Circular.....dis 45 %

Saws, Hack.—See Hack Saws.

Saw Frames.
White, Vermont.....₩ doz $1.50, dis 25&10 %
Red, Polished and Varnished.....₩ doz $1.50, dis 10 %
Saw Rods.....$10 list dis 10&10 %

Saw Sets.
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imitation..₩ doz $3.25 and $5.25, dis 40&5 %
Common Lever.....₩ doz $2.00, dis 40&5 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....dis 20&10 @ 20&10&5 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer.dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 55&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, ₩. No. 15 Hammer, $5.50...dis 20&10 %
Morrill's..No. 1, $15.00; Nos. 3 and 4, $24.....dis 40&10 @ 40&10&5 %
Crossant Keller's No. 1 $15.00; No. 2, $24.00.dis 33⅓&10 %
Boynton's No. 1, $12 ₩ doz; No. 2, $10.....dis 25 %

Scales.
Hatch, Counter, No. 171. .....₩ doz $42.00, dis 50&10 %
Hatch, Tea, No. 161.....₩ doz $15.00, dis 50&10 %
Union Platform, Plain.....$2.15 @ 2.20
Union Platform, Striped.....$2.30 @ 2.40
Chatillon's Grocers .....dis 40 %
Chatillon's Eurekas.....dis 25 %
Chatillon's Family Favorite.....dis 30 %
Family Universal, ₩ doz, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's.....dis 30@30&10 %
Scale Beams, List of Jan. 12, 1882...dis 60&5 @ 60&10 %
Scale Beams, Custer.....dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 20&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $5.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame.....dis 33⅓ %
Screen Corner Irons, Warner's.....dis 33⅓ %

Screw Drivers.
Douglas Mfg Co.....dis 20&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 60&10 %
Stanley R. & L. Co.'s Black Handles.....dis 50&10 %
Sargent & Co.'s Nos. 1 & 20 Forged Blade..dis 70&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel.dis 55&10&10 %
Sargent & Co.'s No. 60, Round Blade....dis 60&10&10 %
Knapp & Cowles' No. 1.....dis 60&10&10 %
Knapp & Cowles' No. 1 Extra.....dis 50&10 %
Knapp & Cowles' No. 00 & 4 .....dis 40 %
Sets Interchangeable.....₩ doz $13.00, dis 25 %
Champion.....dis 25 %
Clark's Patent.....dis 20&10 %
Crawford's Adjustable.....dis 30 %
Knapp & Cowles' Screw-Driver Bits.....₩ doz 90¢
Ellrich's Socket and Ratchet.....dis 25 %
Allard's Spiral, new list.....dis 25 %

Screws.
Am. Screw Co.'s list, Jan. 1, 1885:
Flat Head Iron.....dis 80 %
Round Head Iron.....dis 75&10 %
NOTE.—On above Screws an extra discount of 10 % on ½ inch and smaller is given
Flat Head Brass.....dis 75&10 %
Round Head Brass.....dis 75 %
Russell & Erwin list, April 1, 1885:
Flat Head Iron.....dis 85&10 %
Round Head Iron.....dis 85 %
Flat Head Brass.....dis 85 %
Round Head Brass.....d 83⅓ %

Brass and Silver Capped Screws.....dis 40 %
Lag or Coach.....dis 75&10 @ 80 %
Coach, Patent Gimlet Point.....dis 75 @ 75&5 %
Bed.....dis 35 %
Machine, Flat Head, Iron.....dis 60 %
Machine, Round Head, Iron.....dis 55 %
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %
Hand Rail, Sargent's.....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s.....dis 70 %
Hand Rail, Am. Screw Co.....dis 70 %

Scroll Saws.—Lester, complete, $10.00....dis 25 %
Rogers, complete, $4.60.....dis 25 %

Scythes.
Blood's, Grass.....dis
Blood's Grained.....dis
Other brands.....dis

Scythe Snaths......dis 40&5&2 %

Shears and Scissors.
American (Cast) Iron.....dis 75&10 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ doz $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec., 1881.....dis 60&10&5 %
Heinsch's, List, Dec., 1881.....dis 60&10 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80 %
Second quality C. S. Trimmers.dis 80&10 @ 80&10&5 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel..dis 40 %

Sheaves.
Sliding Door M. W. & Co., list .....dis 66⅔&5&2 %
Sliding Door, R. & E., list.....dis 60&10&2 %
Sliding Door, Corbin's list.....dis 60&10 &2 %
Sliding Door, Patent Roller.....dis 60&10&2 %
Sliding Door, Patent Roller, Hatfield's.....dis 70 %
Sliding Door, Russell's Anti-Friction.....dis 60&10&2 %
Sliding Door, Moore's Anti-Friction.....dis 60 %
Sliding Shutter, R. & E. list.....dis 60&10&2 %
Sliding Shutter, Sargent's list.....dis 66⅔&10 %
Sliding Shutter, Reading list.....dis 66⅔&10 %
Moore's Anti-Friction (Hanging).....New list, dis 25 %

Ship Tools.—L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shovels and Spades.
Ames' Shovels, Spades, &c., Ames' brands.....dis 20 %
Some special brands of Ames' goods.....dis 20&10 %
Griffith's Black Iron.....dis 50&10 %
Griffith's Steel .....dis 60 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony.....dis 15 %
Groom Shovel Co.....dis 20 @ 20&5 %
Hussey, Binns & Co.....dis 20 @ 20&5 %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882.....dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list.....dis 50 %
R. T. Pettebone, Pat. Scoops, new list.....dis 20 %
Remington's (Lowman's Patent).....dis 30 @ 30&10 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron and Brass Head, R. & E. ..dis 60&10&2@60&10&5 %
Iron and Brass Head, P. S. &W.dis 60&10&2@60&10&5 %

Sieves.
Buffalo Metallic, S. S. & Co., new list.....dis 50&20 %
Barler's Flour Sifters.....₩ doz $2 50

Slates.
Square Frames, by case.....dis 45 %

Spoke Shaves.
Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00, dis 50 %
Stearns'.....₩ doz $9.00, dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'.....₩ doz $9.00, dis 20 %

Spoons.
Basting, Central Stamping Co.'s list.....dis 33⅓&2 %
Solid Table and Tea, Central Stamping Company's list.....dis 33⅓&2 %
Buffalo, S. S. & Co.....dis 50&10 %
Britannia.....dis 60&10 %
Meriden Brit. Co., Rogers.....dis 50&5 %
Wm. Rogers Mfg. Co.....dis 50&10 %
Holmes, Booth & Haydens.....dis 50&10@60 %
Holmes & Edwards Silver Co.....dis 50&10@60 %
German Silver.....dis 50 %
Cast Steel, Silver Plated.....dis 40 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30.....dis 50 @ 50&10 %
Tin (Cowles Hdw. Co).....dis 10 %
Tin (Cowles Hdw. Co.), case lots.....dis 20 %

Square.
Steel and Iron.....
Nickel Plated.....
} dis 60&10 & 10&70 %
Try Square and T Bevels.....dis 60&10 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 20&10 %

Steelyards.....dis 40&10 @ 50 %

Stocks and Dies.....dis 5&10 %

"Lightning" Screw Plate.....dis 10 @ 10&10 %

Stone.
Hindostan No. 1, 6¢; Ax, 8¢; Slips, 10¢.....dis 40 %
Sand Stone.....₩ ℔, 5¢, dis 33⅓&10 %
Washita Stone, Extra.....₩ ℔, 16¢
Washita Stone.....No. 1, ₩ ℔, 13½¢
Washita Stone.....No. 2 ₩ ℔, 10¢
Washita Stone Slips.....No. 1, ₩ ℔, 20¢
Arkansas Stone, No. 1, 4 to 6 in.....₩ ℔, $1.35, dis 10 %
Arkansas Stone, No. 1, 6 to 9 in .....₩ ℔, $2.00, dis 10 %
Turkey Oil Stone (Chase)....4 to 8 in., ₩ ℔, 60¢, dis 10 %
Turkey Slips (Chase).....$1.75 ₩ ℔, dis 10 %
Lake Superior (Chase).....₩ ℔, 16¢, dis 10 %
Lake Superior Slips (Chase).....₩ ℔, 30¢, dis 10 %
Grindstones, Family, Loring's.....dis 10 %

Stove Boards.
Buffalo Zinc, S. S. & Co.....dis 50 %

Stove Polish.
Joseph Dixon s.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun.....₩ gro $5.75 net
Dixon's Plumbago.....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro, No. 1, large, $5.50; No. 2 small, $3· No. 3, medium, $1.

Tacks, Brads, &c.
List, Sept. 1. 1882
American Iron Carpet Tacks, all kinds.....dis 65% }
Steel Carpet Tacks, all kinds.....dis 60 %
Swedes Iron Carpet Tacks, all kinds.....dis 60 %
Swedes Iron Tacks.....dis 60 %
Swedes Iron Upholsterers' Tacks.....dis 60 %
Tinned Swedes Iron Tacks.....dis 60 %
Tinned Swedes Iron Upholsterers' Tacks..dis 60 %
American Iron Cut Tacks.....dis 60 %
Copper Tacks.....dis 55 %
Copper Finishing and Trunk Nails.....dis 55 %
Cigar Box Nails.....dis 50 %
Finishing Nails.....dis 50 %
Hungarian Nails and Miners' Tacks.....dis 45 %
Gimp and Lace Tacks.....dis 60 %
Tinned Gimp and Lace Tacks.....dis 60 %
Trunk and Clout Nails.....dis 10 %
Tinned Trunk and Clout Nails.....dis 40 %
Basket Nails.....dis 40 %
Chair Nails.....dis 40 %
Common and Patent Brads.....dis 50 %
Tinned Capped Trunk Nails.....dis 50 %
Looking-Glass Tacks.....dis 30 %
Picture-Frame Points.....dis 30 %
Leathered Carpet Tacks.....dis 30 %
Brush Tacks.....dis 30 %
Shoe Finders'.....List July 1, 1885
Lining and Saddle Nails .....List June 19, 1885
Double-pointed Tacks.....dis 75&10 @ 75&10&5 %
Wire Carpet Nails .....dis50 %
Wire Carpet Nails, R. & E. Mfg. Co.....dis 40&10 %
Steel Wire Brads, R. & E. Mfg. Co.....dis 40&10 %
} Extra 10&2 % for cash.

Tap Borers.
Common and Ring .....dis 20&10 %
Ives' Tap Borers.....Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers.....Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co.....dis 20&10 %
Clark's.....dis 33⅓&35 %

Tapes, Measuring.
American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.).....dis 20&2 %
Punches—See Punches.
Snips, J Mallinson & Co.....dis 33⅓ %

Tinware.
Stamped, Central Stamping Co.'s list .....dis 33⅓&2 %
Japanned, Central Stamping Co.'s list....dis 33⅓&2 %
Pieced, Central Stamping Co.....dis 33⅓&2 %
Pieced, S. S. & Co.....dis 60 %
Japanned, S. S. & Co.....dis 25&10 %
Stamped, S. S. & Co., new list .....dis 33⅓&2 %

Transom Lifters.
Wollensak's Patent Iron Bronzed.....dis 50 %
Reiher's Improved Self Locking (Class 301)....dis 40 %
Reiher's Improved Set Screw (Class 2-1) .....dis 45 %
Reiher's (Class 101).....dis 50&10 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 45&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20&10 %
Wood Bottom.....₩ doz $5.00 @ $5.25
Ali Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ doz $18.00 dis 50&55 %
Wilson's.....dis 55 %
Clipper (Sargent & Co.).....₩ doz $24, dis 50&10&10 %
Acme.....₩ doz $20.00, dis 40 %

Traps.
Game, Newhouse.....dis 35 %
Game, Oneida Pattern.....dis 60&10&10 %
Game, Blake's Patent.....dis 40&10 %
Mouse, Wood, Choker.....₩ doz holes, 15¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ doz $10.00, dis 10 %

Trowels
Lothrops' Brick and Plastering.....dis 20&10 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 70 %

Triers.
Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882.....dis 40 %

Twine.

		HC.	B.
No. 9, Flax Twine,	¼ and ⅛ ℔ Balls	24¢	31¢ ....
No. 12, "	¼ and ⅛ "	22¢	24¢ ....
No. 18, "	¼ and ⅛ "	20¢	22¢ ....
No. 24, "	¼ and ⅛ "	20¢	22¢ ....
No. 36, "	¼ and ⅛ "	19¢	21¢ ....
No. 264, Mattrass,	¼ and ⅛ "		50¢
Chalk Line, Cotton,	⅛ ℔ Balls		28¢
Mason Line, Linen,	⅛ "		60¢

2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine), 14½¢; 3-Ply Hemp, 1 ℔ Balls, 15¢; 3-Ply Hemp, 1⅛ ℔ Balls, 13¢; Cotton Wrapping, 5 Balls to ℔, 14¢ @ 20¢; 2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls, 11¢; Wool, 6¢ @ 6½¢; Paper, 10¢; Cotton Mops—6, 9, 12 and 15 ℔ to doz., 17¢

Vises.
Solid Box.....dis 50&10 @ 60 %
Parallel, Fisher & Norris Double Screw.....dis 15&10 %
Parallel, Stephens'.....dis 25 %
Parallel, Parker's.....dis 20 @ 25%
Parallel, Wilson's.....dis 55 %
Parallel Howard's.....dis 40 %
Parallel, Bonney's.....dis 40 %
Parallel, Merrill's.....dis 15&20 %
Parallel, Sargent's.....dis 60&10 %
Parallel, Backus and Union.....dis 40 %
Parallel, Double Screw Leg.....dis 15&10 %
Parallel Prentiss.....dis 20@25 %
Parallel, Simpson's Adjustable.....dis 40 %

Saw Filers, Bonney's, Nos. 2 & 3..₩ doz $15.00, dis 40 %
Saw Filers, Stearn's.....dis 40 %
Saw Filers Hopkins'.....₩ doz $17.50, dis 10 %
Saw Filers, Reading.....dis 40&1..%
Saw Filers, Wentworth.....dis 20&10 %
Cowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 22 %

Washer Cutters.
Smith's Patent.....₩ doz $12.00, dis 20&10&10 %
Johnson's.....₩ doz $11.00, dis 33⅓ %
Penny's.

WHOLESALE METAL PRICES, August 26, 1885.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ℔ lb; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ℔ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ℔ lb. Railroad Bars weighing more than 25 lb ℔ yard, 7-10¢ of 1¢ ℔ lb.

Standard American Pig Iron.

Foundry No. 1 X	℔ ton	$17.50	@ 18.00
Foundry No. 2 X	℔ ton	16.00	@ 16.50
Gray Forge	℔ ton	15.00	@ 15.50

No. 1 Scotch Pig Iron.

Carnbroe	℔ ton	18.50	@ 19.00
Coltness	℔ ton	19.50	@ 20.00
Shotts	℔ ton	19.50	@ 20.00
Glengarnock	℔ ton	18.50	@ 19.00
Gartsherrie	℔ ton	19 50	@ ....
Langloan	℔ ton	20.00	@ ....
Summerlee	℔ ton	19.00	@ 19.50
Dalmellington	℔ ton	18.50	@ ....
Eglinton	℔ ton	17.50	@ 18.00
Clyde	℔ ton	18 50	@ 19.00

Rails.

Steel, at Eastern mills	℔ ton	....	@ 27.00
Old Rails, Ts	℔ ton	16.00	@ 16.50

Scrap.

Wrought, ℔ ton, from yard ..... 18 00 @ .....

Bar Iron from Store.

Common Iron:			
¾ to 1 in. round and square... / 1 to 6 in. x ¾ to 1 in	℔ lb	1.6	@ 1.75¢
Refined Iron:			
¾ to 2 in. round and square... / 1 to 6 in. x ¾ to 1 in	℔ lb	1.85	@ 2.3¢
1 to 6 in. x ¼ and 5-16	℔ lb	1.9	@ 2.4¢
Rods—⅜ and 11-16 round and sq	℔ lb	1.7	@ 2.3¢
Bands—1 to 6x3-16 to No. 12	℔ lb	2	@ 2.5¢
'Burden's Best" Iron, base price	℔ lb		2.9¢
Burden's "H. B. & S." Iron, base price	℔ lb		2.5¢
Norway Nail Rods			5 @ 6¢

Sheet Iron from Store.

		Common American.	R. G. Cleaned.
Nos. 10 to 16	℔ lb	2.70 @ 3 ¢	3¼¢
17 to 20	℔ lb	3 @	3¼¢
21 to 24	℔ lb	3 @	3¼¢
25 and 26	℔ lb	3 @ 3.12½¢	3¼¢
27	℔ lb	3.25 @	3¼¢
28	℔ lb	3.25 @ 3.37½¢	4 ¢

		B B.	2d qual.
Galvanized, 10 to 20	℔ lb	5 ¢	4½¢
Galvanized, 21 to 24	℔ lb	5½¢	5 ¢
Galvanized, 25 to 26	℔ lb	6 ¢	5½¢
Galvanized, 27	℔ lb	6½¢	6 ¢
Galvanized, 28	℔ lb	7 ¢	6½¢
American Russia	℔ lb	A, 10¢	B, ¢
Russia	℔ lb	10¾¢ @	11½¢
American Cold Rolled B. B.	℔ lb	5 ¢ @	7 ¢

Iron Wire.—(*See Wire.*)

STEEL.—DUTY. Ingots, Bars, Sheets, &c., valued at 4¢ ℔ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ℔ lb, 2¢ ℔ lb; valued above 7¢ and not above 10¢ ℔ lb, 2½¢ ℔ lb; valued above 10¢ ℔ lb, 3½¢ ℔ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ℔ lb in addition to above; Steel Circular Saw Plates, 1¢ ℔ lb in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast	℔ lb	15½¢
Extra Cast	℔ lb	16½ @ 17½¢
Circular Saw Plates	℔ lb	14½¢
Round Machinery, Cast	℔ lb	10½¢
Swaged, Cast	℔ lb	16½¢
Best Double Shear	℔ lb	15½¢
Blister, 1st quality	℔ lb	14 ¢
German Steel, Best	℔ lb	10 ¢
2d quality	℔ lb	9 ¢
3d quality	℔ lb	8 ¢
Sheet Cast Steel, 1st quality	℔ lb	15½¢
2d quality	℔ lb	14½¢
3d quality	℔ lb	12½¢

TIN.—DUTY Plates, Sheets, Tagger and Terne, 1¢ ℔ lb; Bars, Block and Pigs free.

Banca	℔ lb	....	@ 23 ¢
Straits	℔ lb	22½¢	@ 23 ¢
English	℔ lb	22½¢	@ 23 ¢
Bar	℔ lb	24 ¢	@ ....

Charcoal Tin Plates.

I C 10x14 225 sheets	℔ box	$5.00	@ 7.25
I C 12x12 225 sheets	"	5.00	@ 7.50
I C 20x28, 112 "	"	10.00	@ 14.50
I X 10x14 225 sheets	"	6.25	@ 9.25
I X 12x12 225 sheets	"	6.25	@ 9.50
X 14x20, 112 "	"	6.25	@ 9.25
D C 12½x17 100 "	"	5.00	@ 5.50
D X 12½x17, 100 "	"	6.25	@ 7.00
For each additional X add	"	1.25	@ 2 00

Coke Tin Plates.

	Best.	Ordinary
I C 10x14 / I C 14x20	$4.75	$4.62½ @ ....
I C 12x12	4.75	4.62½ @ ....
I C 10x20, gutters, 225 sheets	8.00	7.25
I C 20x28, 112 sheets	....	10.25

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M. F.	$7	....	....
I C 14x20 Old Process	....	....	$6.87½
I C 20x28 "	....	....	14.25
I C 14x20	$4.75 @ 5.00	....	....
I X 14x20	6.50 @ 6.87½	....	....
C 20x28	9 25 @ 9.75	8.75	8.62½ @ 8.75
X 20x28	12.75 @ 14.50	....	....
20x200	13.50 @	....	....

Tin Boiler Plates.

I XX 14x26, 2 sheets for No. 7, 112 sheets	@	$12.00
I XX 14x28, 2 " " No. 8, "	@	13.00
I XX 14x31, 2 " " No. 9, "	@	15.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢: Old Copper, 3¢ ℔ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	℔ lb	11¼¢ @	11¾¢
Ingot, Baltimore	"	10¾¢ @	11 ¢
Ingot Anchor	"	11 ¢ @	11½¢
Braziers' Copper, ordinary sizes, 16 oz. ℔ sq. ft. and over	....	@	17 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ℔ sq. ft	"	@	18 ¢
Braziers' Copper, 10 oz. and 12 oz. ℔ sq. ft	"	@	20 ¢
Lighter than 10 oz. ℔ sq. ft	....	@	22 ¢
Circles less than 84 in. in diam	"	@	20 ¢
84 in. diam. and over	"	@	23 ¢
Segment and Pattern Sheets	....	@	20 ¢
Locomotive Fire-Box Sheets	....	@	19 ¢
Sheathing Copper, over 12 oz. ℔ sq. ft	"	@	16 ¢
Bolt Copper	"	@	18 ¢
Copper Bottoms	"	@	18 ¢
Nickel-Plated Sheathing	"	@	35 ¢
" " for boilers	"	@	37 ¢
Plating extra	25 ¢	@	37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	"	@	21 ¢

Tinning.

14x48, by the case	℔ sheet, 8¢
4x48, less than case	" 8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x48			
14 and 16 oz. and heavier	30¢	By the case	℔ lb 29¢
12 oz. and lighter	33¢	" "	" 32¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

14 and 16 oz. and heavier	32¢	By the case	℔ lb 31¢

(And all sizes not over 20 in. wide.)

24x48 and 30x60.

14 and 16 oz. and heavier			℔ lb 34¢
12 oz			" 37¢

Copper Wire.—(*See Wire.*)

Sheathing Metal.

Yellow Sheathing Metal, ℔ lb ..... 20 @ ....

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 ..... dis. 20 @ 30 %

LEAD.—DUTY: Pig, $2 ℔ 100 lb; Old Lead, 2¢ ℔ lb: Pipe and Sheet, 3¢ ℔ lb.

American			4⅜ @ 4½¢
Bar			4¾ @ 5 ¢
Pipe			6½¢

Block Tin Pipe	40¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	65½¢, dis 20 %
Shot	Drop, 6¢; Buck, 7¢
Chilled Shot	7¢

ANTIMONY.

Hallett's	℔ lb	10 @	10½¢
Cookson	"	10¼ @	10¾¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ℔ 100 lbs.

American, cash			4⅝ ¢ @ 5¢
Bergenport			9¢

ZINC—Duty: Pig or Block, $1.50 ℔ 100 lbs. Sheet, 2½¢ ℔ lb.

600 lb casks			5.15 @ 5.35¢
Zinc.—Open			5¾ @ 6¼¢
Zinc Tubing			dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	℔ lb	6¼ @	7¢
X			.10¢
X X			.15¢
J. B			.30¢

WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos. 00 to 9,	10, 11,	12,	13, 14,	15, 16,	17,	18,
	10	11	11½	12½	14	15	16

Bright Market Wire	dis 70 %
" Charcoal	dis 50 %
" Bale Wire, Nos. 7 to 12	dis 65 %
Annealed Market Wire / " Fence Wire, Nos. 8 and 9 / " Grape Wire, Nos. 10 to 14	dis 70 %
Coppered Market Wire	dis. 65 %
" Bale Wire, Nos. 7 to 12	dis. 60 %
Galvanized Market Wire / " Fence Wire	dis 60 %

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18			dis. 70 @ 70 %
" 19 to 26			" 70 %
" 27 to 36			" 75 @ 75 %
Galvanized Stone Wire			" 55 %

Steel Wire.

Cast Steel, Steel Wire list	dis. 55 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 30.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.70
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ⅓. Warranted			14½ @ 14¾¢
Extra			13½¢
No. 1 Refined			11½ @ 12 ¢
No. 2 "			11¼ @ 11½¢
Extra wiping			11¼ @ 11½¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 40 %
In bulk, new list, Dec. 10, 1881	dis. 40 %
Copper Rivets and Burrs	dis. 50&10@60 %

Nos..	7	8	9	10	11	12	13	14	1
℔ lb..	40¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 65 %
R. B. & W.	dis.
R. & E. Mfg. Co.	dis 65 %

FRENCH GLASS.

Too late for this issue we have received the new price list adopted by the importers of French Glass August 20. The discount now stands 75 and 10, and the list will be given next week.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents ℔ lb.
White Shirt Cuttings, No. 1	6¾ @ 7
" " No. 2	5½ @ 6
Mill Assorted Whites	5 @ 5½
Unbleached Muslins	5¾ @ 6
City Whites, No. 1	4¼ @ 4½
City Whites, No. 2	2¾ @ 2¾
New Canton Flannels	5 @ 5¼
New Seconds, light	3¾ @ 4
" dark	3 @ 3¼
Cotton Canvas	4½ @ 4¾
Linen Canvas No. 1	4 @ 4½
Seconds, City No. 1	1¾ @ 1¾
Seconds, City No. 2	1 @ 1¼
Colors, ℔ cwt	40 @ 50
Manila Rope	3 @ 3½
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	1¾ @ 1¾
" No. 2	1½ @ 1¾
Kentucky Bagging	4 @ 4
Burlap Bagging, No. 1	2 @ 2¼
Tar Shakings	1¾ @ 2
Hemp Twine Stock	3½ @ 3¾
Hard White Shavings, No. 1	3½ @ 4
Soft White Shavings, No. 1	3 @ 3½
White Shavings, No. 2, Soft	2½ @ 2¾
Mixed Shavings, part White	2¼ @ 2⅜
Ledger and Writing	2¼ @ 2⅜
Solid Stock	2⅛ @ 2¼
Book Stock, No. 1, light	1 @ 1½
Old Newspapers	1¼ @ 1⅜
Pure Manilas	1⅜ @
Bagus Manilas and Hardwares, cwt	60 @ 100
Commons, ℔ 100 lb	40 @ 50
Binders' Board Cuttings	½ @ ⅝
Straw Board Cuttings, ℔ cwt	60 @ 70

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	℔ lb	22 @	24¢
" " Carriage			4¢
Black Ivory Drop, fair			12 @ 15¢
" " best			25¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢		
Blue, Prussian, fair to best			40 @ 55¢
" " " in oil			45 @ 55¢
" Chinese dry			70¢
" Ultramarine			18 @ 30¢
Brown, Spanish			1½¢
" Van Dyke			10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7¢		
Green Chrome			15 @ 25¢
" in oil			14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢		
" " in oil	good, 30¢; best, 35¢		
Iron Paint, Bright Red		℔ lb	2½¢
" Brown		"	1½¢
" Purple		"	2¢
" Ground in oil, Bright Red		"	6½¢
" " " Red		"	5½¢
" " " Brown		"	5½¢
" " " Purple		"	6 ¢
Litharge			6½¢
Mineral Paints			2 @ 4 ¢
Orange Mineral			10¢
Red Lead American			6½¢
" Venetian (Eng.) dry			$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs, 8¢		
" Indian Dry			9 @ 12¢
Rose Pink			10 @ 12
Sienna, American Raw, powdered			4 @ 5¢
" Burnt, powdered			4½¢
" " in oil			10 @ 16 @ 20¢
" Raw			11 @ 15 @ 20¢
Umber, Burnt, powdered			4 @ 5¢
" " in oil			9 @ 12 @ 15¢
" Raw, powdered			4 @ 7½ ¢
" " in oil			9 @ 12 @ 15¢
Vermilion, Chinese			58¢
" English			53 @ 55¢
" American, Common			15¢
White Lead, American, pure dry			6¼¢
" " " " in oil			6¼ @ 6½¢
White Paris, English Prime			2 @ 2½¢
Yellow Ochre, French			$1.75
" " in oil...asst'd cans, 11¢; kegs, 8¢			
" " Vermont	in casks, 1½¢		
Yellow Chrome			17 @ 27¢
" " in oil			14 @ 18 @ 25¢
Zinc White, American No. 1, dry			5 @ 6¢
" " No. 1, in oil			9¢
" French (Paris Dry)			5½ @ 7½¢
" in oil			10 @ 11¢

Oils.

Bleached Whale, ℔ gal			55 @ 58¢
" Sperm			$1.00
" Elephant			68¢
Drilling			40¢
B. & R. Best Valvone Cylinder			70¢
Engine			50¢
Fish Oil, Pressed			32 @ 34¢
Lard, Prime Winter			58¢
" No. 1 Extra			52¢
Linseed, Raw, in casks and bbls			48 @ 49¢
" Boiled, " "			51 @ 52¢
" Western, " "			45¢
Machinery			40¢
Miners' Oil			35 @ 45¢
Neatsfoot			60 @ 70¢
Signal			50¢
Tallow			58¢
West Virginia			11 @ 18¢

Sundries.

Asphaltum, Cuban			6½ @ 9½
" Trinidad Refined	℔ ton, $3.20 @ $3.25		
Benzine	℔ gal.	8½ @	9¢
Chalk			½ @ 1¢
" Block			¾¢
Crucibles No. 14 and upward, per number			3½¢
Emery 300 lb kegs			4¢
" less than 300 lb			6¢
Frostings			40c
Glue, White			24 ℔ 35¢
" " Sheet			20¢
Glaziers' Points, Zinc, ℔ box			$5.00
Gum, Copal			30¢
" Damar			25¢
" Shellac, English			80¢
" " " dark			25¢
Mineral Wool, ordinary, ℔ lb			1 @ 1½¢
" " extra			3 @ 3½¢
Pumice Stone, selected Lumps			4 @ 6¢
" " powdered			2½ @ 3½
Pine Tar, bbls			$2.25
Pitch			$1.70
Plumbago E. I. Po., ℔ lb			4 @ 6¢
" American, ℔ lb			6 @ 10¢
" Gun Powder Glazing, ℔ lb			10¢
" Shot Polish ℔ lb			10¢
Putty, in bladders			2½¢
" in bulk			1¾ @ 2
Rosin—Common and Good—Strained			$1.35
" E & F			$1.47½ @ $1.60
" G & H			$1.75 @ $1.90
" I & K			$2.50 @ $3.00
" M & N			$3.75 @ $4.25
Spirits Turpentine, ℔ bbl			35 @ 36¢
Stove Polish, Dixon's	℔ gross		$5.50
" Rising Sun	"		5.50
" Gem	"		4.00
" Jet Black	"		3.00
Waste, No. 1 Cop			9¢
" No. 1 White Machine			9¢
" No. 2 White Machine			8½¢
" No. 1 Colored			6½¢
" No. 2 Colored			6¢
" Washed Machine			8½¢
Whiting, Spanish			5½¢

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STEEL NAILS

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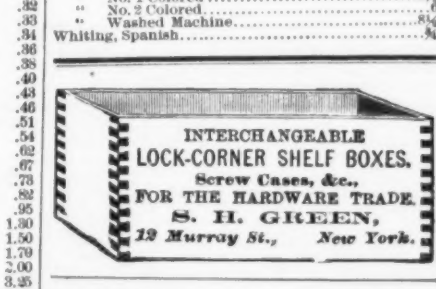

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ALWAYS HAS A STRAIGHT EDGE & FITS CLOSE TO THE FLOOR.
WARRANTED TEMPERED
STEEL-EDGE 1¼ IN WIDE.

TOBACCO NEEDLES,
FOR STRINGING TOBACCO.

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PER DOZEN, $6.00.
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PER DOZ. $6.00.

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528 & 530 MARKET ST., SAN FRANCISCO CAL.

MECHANICS' TOOLS,
CONSISTING OF
Pat. Socket Ratchet and Spiral Screw Drivers,

SAW SETS, SCRATCH AWLS, BELT AWLS,
BENCH AND MOULDING PLANES, manufactured by Ellrich Hardware Mfg. Co., F. A. Howard, and Greenfield Tool Co.
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Cold Rolled Iron and Steel,
For Blanking, Stamping, Cupping and Drawing.
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MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT
GRAY IRON CASTINGS
OF ALL DESCRIPTIONS TO ORDER.
PATTERN MAKING & JAPANNING. CORRESPONDENCE SOLICITED.

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INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

The proprietors of the Somersworth Machine Shop and Bobbin Works, Great Falls, employing 350 hands, have decided to remove their works to Dover, on condition that the citizens present them with a 7-acre lot of land on Broadway, next to the Boston and Maine Railroad. A committee of citizens, with Hon. J. E. Lothrop as chairman, has commenced to collect the needed amount, and a considerable portion has been subscribed.

MASSACHUSETTS.

The Edison Illuminating Company, Lawrence, have ordered two more Armington & Sims engines, making five in all at use in their station.

The manufacture of oil stoves at the Florence Machine Shops is increasing, especially on the new hand stove recently put on the market. Three hundred a day have been made, but the capacity of the shops is to be increased at once to 500 a day.

The Worcester Steel Works, Worcester, have a contract to make 200 tons of a new pattern of street-railway rail recently patented by President C. A. Richards and Roadmaster Elizur Barnes, of the Metropolitan Railroad, Boston.

CONNECTICUT.

The Ingraham Mfg. Co., of Bristol, are making extensive additions to their clock manufacturing works. Very soon this firm will have 400 men on their pay-roll.

There have been evidences of a revival of business in several manufacturing establishments in Hartford. The Colt Company are now running on full time, and give employment to about 600 men. Other large concerns—those filling foreign orders, building machine tools and bicycles—report an improved condition in the market.—*Boston Commercial Bulletin.*

It is proposed to again set in operation the Cook Axle Company's works at Winsted.

NEW YORK.

Clove Furnace, operated by the Parrott Iron Company, at Greenwood, is out of blast. The furnace chilled and work was suspended in the mines of the company several days ago. The furnace used anthracite. It is stated that the company are financially embarrassed, but no assignment has been made. The liabilities are said to be from $100,000 to $200,000, with assets consisting of real estate, plant, &c., of $500,000. The furnace was built in 1854. Some $5000 or $6000 are due the employees, but they express their faith in the ability of the company to pay them in full.—*Iron and Steel Association Bulletin.*

PENNSYLVANIA.

The Manhattan Hardware Company, as now known, is a New York corporation, but in order to be a thorough Pennsylvania corporation they intend organizing under the laws of that State, with headquarters at Reading, and will apply for a charter, with the following directors for the first year: D. H. Fitzgerald, William Kearns and Joseph P. Egan, of Reading; John P. Kelly, of Scranton, and Thomas J. Hurley, of New York, with a paid-up capital of $100,000, with the privilege of increasing to $1,000,000. The business will be managed by the three first-named directors, with a warehouse in New York and agencies in Boston, Philadelphia, Baltimore, Chicago, San Francisco and Montreal, Canada, and one in London, for some of their patented specialties. The Manhattan Works were established at Reading three years ago. The digging of the foundation for the new works which the company propose to erect in North Reading, where they purchased 14 acres, will be commenced next week. It is expected that the establishment will be completed by December 1, and Manager Fitzgerald says about 1000 hands will be employed

The rolling mill of the Hollidaysburg Iron and Nail Company shut down on August 23 on account of lack of orders and the necessity of making repairs. It will take several weeks to make the repairs.

The Economy Gas Company have been organized at Beaver Falls, with a capital of $250,000. This company own leases to 7000 acres of gas territory in Beaver County, and have just struck one of the largest wells that has been found in Western Pennsylvania. Two more wells are being drilled, and the gas will at once be piped to Rochester, New Brighton and Beaver Falls, as well as other points in the Beaver Valley This development, in addition to gas wells already producing in the same region, shows a large area of very prolific territory tributary to the prosperous towns of Beaver Valley. The incorporators of the Economy Gas Company are Hon. Henry Hice, of Beaver; H. C. Fry and J. H. Lippincott, of the Rochester Tumbler Company; H. W. Hartman, of the Hartman Steel Company, of Beaver Falls, and D. A. Stewart and S. E Moore, of Carnegie Bros., Pittsburgh, and A. F. Brown, of Jamestown, N. Y., from whom the gas territory was purchased.

No. 2 of the anthracite furnaces at Cornwall, owned by Robert H. Coleman, was blown in last Friday. No. 1 is being improved and repaired preparatory to being blown in shortly.

No. 3 furnace of the Crane Iron Works was blown out on August 15, to undergo repairs.

S. J. Cresswell, iron founder, Philadelphia has been successful in securing the contract for the ironwork on the new Court House in Joliet, also for the new City Hall in Grand Rapids, Mich. Mr. Cresswell has also just completed an order for Cuba, and has secured the contract for 280 iron columns in Wanamaker's Grand Depot in Philadelphia.

C. Hennsler, Thrift File Works, Philadelphia, has enlarged his place considerably, putting in a 300-horse-power engine and several new machines. With increased facilities Mr. Hennsler expects to fill all orders promptly.

The five remaining furnaces in the plate mill of the Pottstown Iron Company, which have been idle for some time, started up on August 17. Arrangements are also being made to put the new Universal mill in operation. The work of repairing the blast furnace of the company preparatory to putting it in blast again is being pushed forward rapidly. David Snyder, of Myerstown, has the contract of relining the stack and has a large force of men at work.

It is understood that the heaters, helpers, rollers and those working about the rolls at Ellis & Lessig Steel and Iron Company's Works, Pottstown, have received notice of an increase in their wages amounting to 10 per cent. and running up as high as 20 per cent., and with prospects of double turn and plenty of work. The heaters and helpers in the Pottstown Iron Company's mills have also received a substantial raise in their wages.

A charter was issued at the State Department, on August 20, to the Lickdale Iron Company, of Lebanon, with a capital of $10,000. The corporation will manufacture iron and steel. The incorporators are James Meiley, of Lickdale; John H. Lick, C. Penrose Sherk, John Meiley and Richard Meiley, of Lebanon.

J. W. Moore & Co., of Greensburg, are putting up 192 new coke ovens at their works on the Sewickley branch of the Pennsylvania Railroad. The Black Lick Manufactory are furnishing the brick.

The Phœnix Glass Works, at Phillipsburg, which have been shut down for the past three weeks, started six shops to work on colored ware on August 20, and if orders continue to accumulate their whole works will be fired up.

The notice in *The Iron Age* for August 6th of the 27,000-pound open-hearth steel casting turned out by the Standard Steel Casting Company, of Thurlow, has attracted the attention of other manufacturers of steel castings. Mr. Joseph Morgan, Jr., chief engineer of the Cambria Iron Company, has sent us some data relating to large steel castings made at Johnstown by the works under his charge: "Three years ago we made a gear-wheel which weighed 24,000 pounds, finished weight, and it was duplicated two years ago. Six months ago we poured two roll castings taking 30,000 pounds each, or about 27,000 pounds after the sink-head was cut off. These castings were turned throughout, showing perfect solidity and great toughness. We are now at work at the 40-inch blooming train. We have the ability to make a casting up to 25 tons rough weight."—*Iron and Steel Association Bulletin.*

PITTSBURGH AND VICINITY.

Wm. Clark & Co., and J. Painter & Sons have recently been doing a considerable business in steel cotton ties.

The Lewis Foundry and Machine Company have just about finished a rolling mill for capitalists at Hamilton, Ontario, The mill has a single train of rolls, and the foundry has been rushing the order right along. The last shipment will be made next week.

A fire at the foundry of the American Iron Works, Jones & Laughlins, proprietors, on August 16, did $2000 damage, all of which is covered by insurance.

Referring to the large 13-ton shear made by Totten & Co., Cavell & McKnight state that they have made a shear weighing 75 tons for the Pittsburgh Steel Casting Company, which is running at the latter company's works. They also made one for the Linden Steel Company, of about the same weight, which recently was cutting steel 7½ x 12 feet.

OHIO.

The Foster Stove Works, Ironton, are now employing 21 men and are melting between 2500 and 2800 pounds of metal per day. The erection of a warehouse is about to be commenced.

The Elson Glass Works, Martin's Ferry, have fire in their furnace in readiness to start.

The Morse Bridge Company, of Youngstown, have secured the contract for the furnishing of the ironwork for the new city bridge which is to be built across the Mississippi River at St. Paul. The contract calls for 2400 tons of beams and columns, and is to be delivered in St. Paul by March 1, 1886. At this time it is supposed that work will be commenced and the bridge pushed to completion.

Gill Bros. & Co., glass manufacturers, Steubenville, are making repairs on their furnace and will start up in about 10 days.

The Lake Erie Carbon Company, capital stock $10,000, is a recent Cleveland enterprise.

ILLINOIS

A 150-horse-power engine and boiler for the Plano Steel Works, and the following other work, have been ordered of the Excelsior Iron Works, of Chicago: A 20-inch steel water-pipe to go to Idaho; a second hoisting and traveling apparatus for the Chicago Gaslight and Coke Company; a coal hoist for the same company; and a 75-horse-power boiler and fittings for the Deaf and Dumb Asylum at Jacksonville.

The Illinois Pavement Company have been incorporated to manufacture, sell and lay iron pavement, with a capital stock of $250,000. The incorporators are Charles Peck, Horace H. Waters, Charles H. Kirkham and Homer N. Hibbard.

The Matchless Metal Polish Company, of Chicago advise us that at the World's Industrial and Cotton Centennial Exposition, held in New Orleans, their polish received the highest award. The company are in receipt of many letters from all parts of the country indorsing the polish, which is used for cleaning all kinds of metals. The company have become incorporated and are in a position to promptly meet the demands of their rapidly increasing business.

INDIANA.

Charles Hegewald & Co., New Albany, report business as very good, especially in steamboat machinery. They are erecting a large building for boiler and sheet-iron works, which branch of business is booming.

The American Foundry, New Albany, in connection with the N. A. Rail Mills, run two heats a day. They have large contracts with the St. Louis Street Cable Road, the L., E. and St. Louis Railroad, and L., N. A. and C. Railroad. They have also some very heavy castings for De Pauw's Glass Works. The men work double time and rejoice in prosperity.

The Indianapolis Rolling Mills, Indianapolis, will resume operations at an early day on merchant iron.

The Ohio Falls Car Works, Jeffersonville, have been reorganized and are now prepared to go to work as soon as sufficient contracts are secured to justify a resumption. The machinery has all been put in thorough order. The works will give occupation to 2000 men.

Work has been begun at the Howards' Ship Yard, Jeffersonville, on the steamboat for South American waters. She will be completed here and then carried in sections to her destination.

The Lafayette Car Works will resume operations next week after a month's cessasion of work, on three-quarter time.

MISSOURI.

The mill of the St. Louis Bolt and Iron Company is running moderately, but regularly.

The St. Louis Shot Tower and the Collier Tower are both in operation preparing for the fall business, which is considered promising.

The Duggan-Parker Hardware Mfg. Co., of St. Louis, have both their gray and malleable iron departments going, and under the encouragement given by increasing orders have been adding to their molding force for a month past. They still have room for more molders.

George Felber's Machine Work, of St. Louis, are furnishing the new Western Rolling Mill, of East St. Louis, with a considerable quantity of shafting, pulleys, couplings and boxes.

MICHIGAN.

Vulcan Furnace, at Newberry, will go into blast early this month, its plant of 50 charcoal kilns being completed and ready to do service supplying the furnace with fuel. The furnace when in operation will give employment to a force of 200 men, including the choppers engaged in getting out wood for the kilns.

Fond du Lac Furnace will blow out on December 1. It is stated that the cost of production is too high to permit the plant to run without loss.

WISCONSIN.

National Furnace finished blowing out Wednesday evening. The management expected to finish sooner, but, as the furnace was not in first-class condition and all loose ore was gathered up, a little more time was necessary. The furnace has been in blast on the present hearth a year lacking about a week, and the output has been satisfactory. It has now shut down indefinitely.—*De Pere News.*

WEST VIRGINIA.

The Benry Coal and Coke Company, of Charleston, have purchased the Fayette Coal and Coke Company's property at Stone Cliff, Fayette County, on the C. and O. R. R. The plant consists of 60 coke ovens, 60 miners' houses, large storeroom and fine stock of goods, the mines and all the necessary fixtures. The mines have a capacity of about 400 tons a day. The present owners will double their capacity in a short time.

TENNESSEE.

Huston & Mills, of Akron, Ohio, have purchased ground in Dayton, on which they will erect a foundry and machine shop.

Citico Furnace, which was blown out several months ago, has resumed operation.

There is a probability that Chattanooga Furnace will blow out soon for repairs.

KENTUCKY.

James W. Ainslie, president of Ainslie, Cochran & Co., Louisville, has retired. He is one of the oldest and most thorough machinists in the business. The business will continue under the same name and under the supervision of Mr. G. E. Thurman.

The Joseph Mitchell Boiler Yard, Louisville, has enjoyed a run of unprecedented good business. A ceaseless stream of work is going on all the time.

ALABAMA.

The St. Clair Coal Company, Trout Creek, have been organized, with a capital of $50,000.

C. J. Scheelky, Martinsburg, W. Va., contemplates erecting a factory in Birmingham, for the manufacture of a sash balance and clamping device.

The Birmingham Coal and Coke Company are a thing of the past. Their leased lands have reverted to the owner, the Sloss Furnace Company.

A company has been organized to mine gold in Cleburne County, and is getting its equipment.

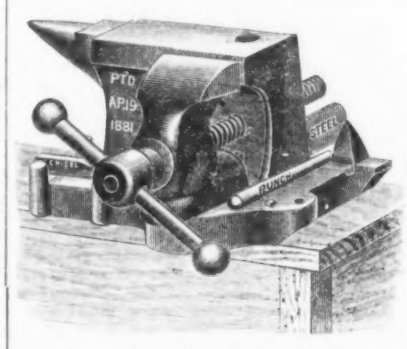
The directors of the Alabama Improvement Company met at Tuscumbia last Wednesday, and arranged certain unsettled points in their contract with Messrs. Hervey & Beebe, of New York, for the construction of their railroad to Birmingham. They seem confident now that work will begin on the road very soon, possibly within 30 days.

The "Boss" Upset.

HARDWARE NOVELTIES.

Allen's Combined Anvil and Vise.

We show in the accompanying illustration a convenient tool for farmers and mechanics, which has the advantage of cheapness,



Allen's Combined Anvil and Vise.

retailing complete for $2.50. It is manufactured by the Palmyra Scale Works, Palmyra, N. Y. It is described as well made, durable, and for farmers' and general domestic use it has an obvious value.

Automatic Check Snap.

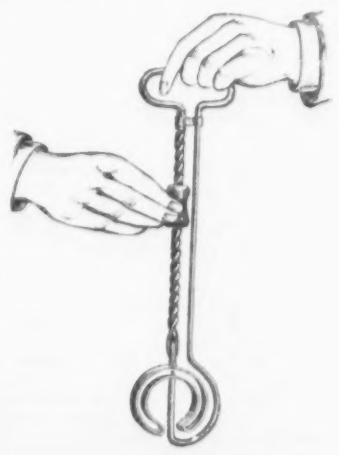
Chapman & Parker, Meriden, Conn., have recently begun to manufacture an Automatic Check Snap, a general view of which, illustrating its working, is given in the accompanying cut. The check snap is made both for overdraw and side checks, and is positive in its action. The tongue, which is cushioned with leather, is worked by an automatic spring and is perfectly noiseless in action. The tongue being constantly pressed out by the spring, it is impossible for a horse to

Automatic Check Snap.

throw his check-line when this snap is used. To release the check-line the tongue is pushed forward by means of the thumb-piece on top, when the snap can be readily slipped off the hook. These snaps are finished in gold and nickle plate and black enamel.

Bryant's Egg Beater.

The Egg Beater shown in the cut below is manufactured by Paine, Diehl & Co., 12 Bank street, Philadelphia, Pa. The shank of the beater has a screw-thread formed on it which carries a loose-fitting nut. By raising and lowering the nut, as shown in the illustration, the beater is driven alternately to the right and left. The double motion is referred to as a feature of this beater and of particular advantage, in that it cuts and recuts the egg and arrests all currents



Bryant's Egg Beater.

formed, thus whipping the egg into a perfect froth. Describing the egg beater, the manufacturers mention that it has no gears to get out of order, and does away with the crank, which they refer to as an objectionable feature in the ordinary article, since from the nature of its motion it makes the beater slip in the vessel used for the eggs. The ease with which the beater is operated is also alluded to. The price is mentioned in the Trade Report.

The "Boss" Upset.

The cut below illustrates a Patent Saw Swage and Sharpener made by John Mather, Leominster, Mass. This swage, it will be perceived, is made round, and not as others, with square corners. Another feature referred to as an advantage in this upset is the manner in which the band is put on. The band sometimes gives considerable trouble by coming off during use. To remedy this fault in the "Boss" upset, the band is screwed on, which makes it impossible for it to loosen or come off. One size of this swage is said to do the work of four sizes of the ordinary tool, besides doing the work with a less number of blows, the latter feature being referred to as a great advantage in that it avoids all danger of racking the teeth.

At a meeting of the Copper Queen Mining Company, held on Tuesday in this city, the shareholders assented to a plan of consolidation with the Atlanta, an adjoining mine belonging to the well known firm of Phelps, Dodge & Co. The latter receive for their property $200,000 and two-sevenths of the shares of the new co-operation, the Copper Queen Consolidated. It is stated that the cost of first purchase and development of the Atlanta foots up to about one-half the money received for it. It is spoken of as showing reserves of ore fully equal to, if not better than, any the Copper Queen ever possessed. The body of the latter mine is approaching exhaustion, since the ore pitches into the Atlanta ground. It is understood that the consolidation will not in any way increase the average product of the old company, the owners preferring not to exhaust reserves in times of low prices.

Some English Gun Works.

Vickers, Sons & Co., Limited, Sheffield, have supplied gun tubes for many years to both home and foreign Governments. They have eight furnaces of 10 tons capacity, from which they have cast ingots of 70 and 80 tons in weight, and with a push could cast ingots of 100 tons from the same furnaces. For manipulation they have hammers from very small size up to and including one with a tup of 15 tons and 10-foot stroke, and with 60 pounds of steam have, it would appear, reduced a 70-ton ingot. They have lately put down a monster press for dealing with still larger ingots. The melting-house and hammer shops are well fitted with large cranes equal to any weight they can cast, as well as being provided with reheating furnaces of the most improved type—*i.e.*, Siemens regenerative furnaces. Messrs. Vickers have also a rolling mill for the production of large gun jackets.

C. Cammell & Co., Limited, Sheffield, have supplied some gun tubes to the British Goverment. At their Grimesthorpe Steel Works they have nine melting furnaces of 6 to 12 tons capacity, and are building three new furnaces to melt 20 tons each. For manipulating these they have a spacious hammer shop in which stands a large steam-hammer with a tup of about 25 tons weight, surrounded with suitable cranes and reheating furnaces. They also have in hand a 100-ton crane and a 50 ton ladle, thus showing they are in a position to undertake forgings of very large size.

T. Firth & Sons, Limited, Sheffield, are and have been engaged in the gun trade for over 23 years, and in that period of time have supplied guns to every nation using those articles in larger quantities, and, having been engaged in this trade for so long a time, their works are known both at home and abroad by artillerists as "The Gun Works," *par excellence*. In their gun foundry they can cast ingots of about 30 tons weight out of crucibles alone; that was their limit until recently, but now that weight can be exceeded by 25 tons, and extensions are at the present time going on whereby their productive power will be increased by about 45 tons more. In other words, they are now in a position to cast about 50-ton ingots, and in a short time will be able to make them 90 to 100 tons in weight, for the hammering of which they are already well prepared, having in their gun works, among others, two hammers with tups of 25 tons weight each, 10-foot stroke and working at 60 pounds steam pressure. There are three powerful cranes to each hammer, as well as several of Siemens regenerative gas furnaces, so that, bearing in mind what the Vickers have accomplished with their 15-ton hammer, it is plain to be seen that the Firths, with their two 25-ton hammers, are in a position to deal with the heaviest kind of forgings that may be required for some time to come

Sir J. Whitworth & Co.'s works are situated at Openshaw, Manchester They have three melting furnaces of the following capacity: No. 1, 15 tons; No. 2, 12 tons; No. 3, 12 tons. Thus their productive capacity is 39 tons. The largest ingot made in those works was 42 tons in weight. They have also some few crucibles. When the metal is run into the ingot mold, pressure is applied by a press said to be of 8000 tons capacity, but which is rarely worked above 4000 tons; afterward the ingots are reheated in old-fashioned air furnaces (not gas). If they are above 24 inches in diameter they are forged under the hydraulic forging press. Whitworth has five of these presses, with rams from 20 to 32 inches diameter, which are said to give a pressure of from 780 to 2000 tons.

Ex-Engineer Seymour has written a letter strongly urging the improvement and deepening of the canals. He says: "The canal should be deepened to allow at least 2 feet of water under a boat to enable it to move freely, especially in the case of steamers, which are retarded by friction."

The Pike's Peak Railway, which is now in operation to a point over 12,000 feet above the sea level, when finished a few months hence, will mount 2000 feet higher than the Lima and Oroya Railway, in Peru.

The Manufacture of Plate Glass.

The expression "French plate glass" leads one to think that foreign nations make all of this kind of glass. That is far from being the fact. There are in the United States four works for making plate glass. One is located at New Albany, Ind.; one at Jefferson, Ind.; one at Crystal City, Mo., and the one described in this paper at Creighton, Pa. Plate glass is made by casting and afterward polishing. The pots in which the materials are melted and the glass made are of great capacity, and require heavy and convenient machinery for pouring. The casting is done on a heavy metal slab, larger than the largest sheet of glass produced, and this slab rests on a car which runs on tracks leading from the melting furnaces to the annealing-rooms. A large iron roller running on strips of iron at each side of this table presses the molten glass into a sheet as the workmen pour it in front of the moving roller. The thickness of these strips of iron on which the roller rolls determines the thickness of the plate of glass.

While the glass is yet hot it is thrust into an annealing oven, where the temperature is gradually lowered for several days until it is cold. The surface of the glass is now very rough and uneven, and, though it is translucent, it is not transparent In this form it is used for skylights and for places where strength and light are required without transparency. After the plate comes from the oven it is firmly fixed upon a large rotating table or platform which revolves quite rapidly. Over its surface two disks rotate and revolve in such a manner that they cover the entire surface of the glass at each rotation of the platform. The attending workmen throw common river sand upon the surface of the glass, which is kept constantly wet by small streams of water. This process grinds off the rough exterior, after which it is ground with emery on machines of similar construction. Beginning with coarse emery, they gradually change the grade until the finest powder is used to finish the grinding. After the grinding is complete the surface is polished by rouge on machines constructed on the very best principles for making perfect surfaces.

From the time the glass leaves the annealing ovens until it is perfectly polished the workmen examine it from time to time for any flaws, bubbles or defects, as grains of annulled sand. Only those large plates which are free from defects of any kind are polished entire. When a flaw is discovered in a large plate of glass, the plate is cut into smaller ones of marketable dimensions. This branch of the trade requires trained and skillful workmen who have good judgment. After the glass has been properly polished and cut into required sizes it is boxed ready for shipment.

The works of the Pittsburgh Plate Glass Company are located at Creighton, about 20 miles above Pittsburgh, on the west bank of the Allegheny River. There are about 8 or 9 acres covered with buildings, along a side track of the West Pennsylvania Railroad, which are used for the various purposes of manufacture, storehouses, furnaces, casting-houses, stables, offices, &c. One of the buildings, 650 feet long by 160 feet wide, is the casting-house. It contains 60 ovens for annealing glass and 2 furnaces for melting. Each annealing furnace is over 40 feet long by nearly 20 in width. Each melting furnace contains 14 pots. The apparatus for casting consists of 2 iron tables, 7 inches thick and 19 feet long by 14 feet wide; 2 iron rollers, 30 inches in diameter and 15 feet long. These tables are on carriages which move on a track which reaches every furnace and is nearly 1 mile in aggregate length. There are also cranes, tongs, ladles and pulleys, which are most conveniently arranged for rapid work. The first building in which the plates of glass meet machinery driven by steam is the grinding-house. This building is over 200 feet long by 80 feet wide. There are 8 rotary grinding machines in this building. Each machine requires 40 horse-power, and all are driven by 2 double vertical engines. There is a second grinding department, which contains 2 machines of the latest French pattern. These machines require 120 horse-power, and do most excellent work rapidly.

The glass is smoothed in a building about 100 feet x 200 feet. In this house there are 20 smoothing machines, which require the power of two engines of 40 horse-power each to drive them. Next in order is the polishing-house. This is the same in size as the smoothing-house. There are 16 polishing machines, each 11 x 20 feet, driven by two engines of over 800 horse-power. The company make their own melting pots, and in this building a steam engine of 30 horse-power grinds and mixes clay. There is a department where plate-glass mirrors are made, and this requires the help of a large engine to drive machinery for beveling the edges of plates of glass. This department has proved a perfect success, and many beautiful mirrors are made here, ranging in price from $1 to $500.

There is also a large foundry and machine shop, where all the machines used in the "plant" are made or repaired; and a shop for making boxes, where an engine runs saws and planers. The company employ 345 men, 45 boys and 15 women and girls. They have lately built a steam dredge for collecting sand from the bottom of the river for grinding glass. Three million bushels of sand are required each year for grinding purposes alone. The white sand from which the glass is made is shipped from McVeytown, Pa. The amount of glass cast each month is 95,000 square feet. About 3 per cent. of this is used for skylights; the rest is polished, making an output of 70,000 feet of polished glass per month, after allowance is made for cutting and breakage.

The novel feature about these vast works—where engines aggregating nearly 1500 horse-power are fed by steam, and 60 annealing ovens and two melting furnaces require fuel—is the entire absence of coal and the use of natural gas in its stead. The company own two gas wells, which are about 1150 feet deep, and they are now running their entire works with a little over one-half the production of one well. The pressure at the well is 260 pounds per square inch. This pressure is reduced at the well to 120 pounds, and, as the line works wide open, the pressure in the regulator at the works is lowered to 80 pounds. The pressure is still further reduced before it enters the furnaces. The pipe which conveys the gas to the works is 4 inches in diameter. The surplus gas is used in the town for heating and lighting, and as they are able to consume but a small quantity of this, compared with the supply, a tube, high in the air, sends out a large flame which lights up the surrounding country.

Glass made by this fuel is decidedly superior to that made by the use of coal. No coloring material can get into the melting pots, and the flame of the burning gas is free from impurities which would injure the quality of the glass. Several inches of this glass, when seen through from edge to edge, show no appreciable color. This is the most apparent advantage gained, but there are others of no less importance. The control which the workmen have over the heat in the melting furnaces, and especially in the annealing ovens, enables them to make glass of great durability and strength. At present the company are in a flourishing condition, and have all they can do to supply the demand for goods. They make glass cheaper than any other plant in this country, and can compete with either the French or the English, inasmuch as their fuel costs them practically nothing, the gas used taking the place of 3000 bushels of coal per day.

NEW PUBLICATIONS.

USEFUL INFORMATION FOR ARCHITECTS, ENGINEERS AND WORKERS IN WROUGHT IRON. Phœnix Iron Company, 10 Walnut Street, Philadelphia.

The Phœnix Iron Company, whose agents in this city are Messrs. Milliken & Smith, have issued a revised edition of their handbook. They show first the different shapes they roll, including I-beams, deck beams, channels, column sections, ties, angles and brackets. We note two new beams, to which we have already alluded, and five new channels. A price current follows, giving the extras on rounds, squares, flats, the weights and sizes of shapes, the lengths of Phœnix columns rolled with extras, a list of die-forged eyes on flat bars, and of upset screw ends on round bars. Then follows a brief chapter on some of the details of construction employed in wrought-iron work and the adaptations of the various shapes to structural uses. Thus, there are tables giving the elements of Phœnix beams, the comparative strength and stiffness of the different sections of wrought-iron beams made by the Phœnix Iron Company, and their adaptation and duty as flooring joists. Different designs of fire-proof construction with iron and hollow brick are illustrated, with a description and an illustration of Wight's method of fire-proofing and preparing for smooth-finish Phœnix wrought-iron columns. The details of construction showing the use of Phœnix columns with wrought-iron and with cast-iron connections are added. Then follows a chapter on iron trusses with details, a record of tests of columns and beams, and a final chapter giving tables of weights and measures and miscellaneous data. The book is small and handy and is neatly bound.

THE APPLICATION OF WIRE-ROPE TRAMWAYS FOR PURPOSES OF ECONOMICAL TRANSPORTATION. By F. C. Roberts, C. E. Published by the Trenton Iron Company, Trenton, N. J.

Mr. F. C. Roberts has compiled for the Trenton Iron Company a small pamphlet of 20 pages, a brief review of the different systems of wire-rope tramways which are gradually finding favor in this country. Mr. Roberts treats the different modifications of the wire-tramway system under three heads—the fixed rope, the single moving rope and the double moving rope systems. As an example of the first he illustrates and describes the road at the Aalsund Iron Mines, in Norway. The second is given more detailed consideration, since it is in reality the most important. Mr. Roberts states that the Trenton Iron Company have adopted several new curb devices suitable to various requirements, without, however, giving details, a somewhat serious omission in a special work of this character, which, we take, it intended to furnish would-be buyers with full data. In the third chapter the double moving rope system is described and well illustrated. The fourth is devoted to a consideration of the advantages of the systems described.

A Wisconsin Iron Enterprise.

The existence of iron in large quantities in the mound about 1 mile north of the depot at Black River Falls, Wis., has been known from the earliest settlement. Over a quarter of a century ago, in the fall of 1857, several German capitalists somewhat posted on iron visited the spot and saw at once that here was an abundance of ore, far better than that they had seen profitably mined in the East. With an unbusinesslike jumping at conclusions they decided that they had found a bonanza, apparently never thinking of the difference of circumstances, there being no railroad nearer than Portage, and no considerable Western market, the country being entirely undeveloped, and all the conditions unfavorable to profitable mining. Accordingly, they made free outlay of their good money, paying $1.50 a hundred for hauling their material from La Crosse, improving country roads at great expense, building a furnace, having a small mountain of charcoal made and otherwise preparing for a heavy campaign. Tradition says that these free-handed gentlemen seemed so willing to unload their wealth that almost the entire community gave them cheerful assistance and bled them profusely whenever occasion offered. So crude and impracticable an attempt could result only in failure, and a few months brought it to an unhappy end. Since then the spot has been an object of great interest. Residents have regarded it with mingled hope and doubt. Geologists have gazed upon the indications with scientific non-committal, wishing the early miners had but had wisdom and experience equal to their enthusiasm, and had developed the mine sufficiently to give evidence of what it was worth. A few years ago a systematic inspection was begun, and the mound was almost honeycombed with shafts, tunnels and ditches, at an outlay of between $15,000 and $20,000, solely to determine to a certainty the value and extent of the ores, which include magnetite and hematite. The result was entirely satisfactory.

The organization of the present company was completed last spring. It is made up of prominent Minneapolis men, among them S. C. Gale and O. A. Pray, well known as reliable business men and not speculators. The paid-up capital is $160,000. The citizens contribute a cash bonus of about $12,000. A spur track of the Omaha road was completed last week from near the depot to the further side of the mound, a distance of over a mile. The cost of this, says the Milwaukee *Sentinel*, cannot have been less than $25,000, and, as the iron men guarantee the railroad company against loss, it is evident that they have thorough faith in the venture. Excavations for the furnace and work upon other buildings, at a point on the track on the city side of the mound, have been in progress several weeks, and the rising stack of the blast furnace will soon be visible from the train as it pulls across Black River.

The half-yearly report of the Improved Industrial Dwellings Company of London has been issued, and the usual dividend of 5 per cent. is recommended for payment. The company now possess 34 estates in various parts of the metropolis, on which 4739 dwellings have been built and are in occupation and 232 are in course of erection and completion, making a total of 4971 tenements. When these are completed the number of persons residing on the company's estates will be upward of 25,000. The expenditure on capital account has now reached £922,652.

Chili now owes on account of her railways $24,870,000. In 1883 these railways earned a revenue of $6,516,049 on a capital of originally less than $60,000,000, and which is now reduced to $22,450,000. The railways of the Argentine Republic are on the average earning an annual dividend of 6½ per cent.

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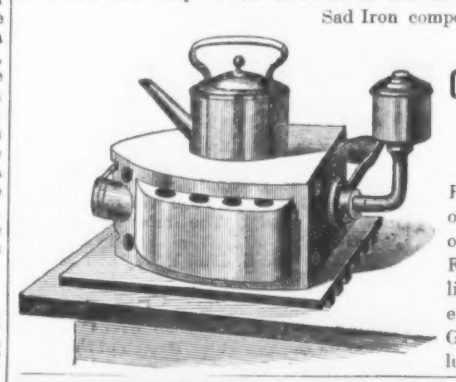

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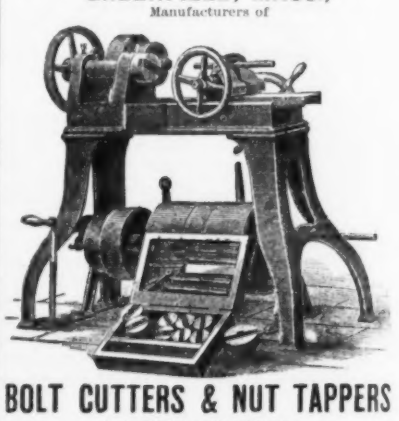

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THE WEEK.

The second annual report of Commissioner Peck, of the State Bureau of Labor, avers that the worst form of child labor prevails in this State, that the compulsory education law is a dead letter, and that the sanitary condition of many of the mills is a disgrace to civilization.

The condition of Peru, as described by United States Consul Brent, at Callao, is deplorable. The most productive part of the country, back of Lima, is the constant scene of disorder, fatal to trade, and, while the local demand is comparatively insignificant, exports are decreasing. The national revenue will not exceed $3,100,000. A vessel arriving at Callao with cargo must pay a lighthouse due of 1¼ cents per registered ton; 20 cents, silver, tonnage dues per ton; 4 cents hospital dues per ton; 12 cents per ton for the obligatory discharge in dock, and 10 cents per ton for a new impost, recently established for the purpose of increasing sanitary facilities, which may be termed health dues. Add to these a charge of 75 cents on every ton of cargo discharged, to be paid by the vessel to the docks, and we have the heavy burden of $1.22¼ per ton imposed on every ship entering Callao for discharge, besides, of course, the additional items of agency and labor. A vessel chartered abroad for this port demands from 7/ to 10/ extra per ton, in order to meet these unusual disbursements. As a logical consequence, the purchaser of the merchandise brought by the vessel is the sufferer in the end, and by the time the goods have paid duty at the custom house their value is phenomenal. Tobacco sold in New York at 50 cents per pound costs the smoker here $1.59.

Ex-Minister Bingham, who for 13 years has represented the United States at the Court of Tokio, being questioned in reference to trade in that country, spoke of the great resources of Japan and their rapid development. After 12 years of intercourse with the leading trade countries of the world the exports of Japan now amount to $38,000,000 annually, consisting chiefly of tea, silk, porcelain, lacquer-ware and Japanese curiosities. Against this annual exportation there is an importation of $37,000,000 worth of goods every year. "Take away treaty restrictions," said Mr. Bingham, "and give the Government the liberty of action which is its inherent right, and it will not be a wild calculation to say that Japan will consume over $100,000,000 worth of foreign productions in a short time. The United States ought to have the control of this commerce. Now, the only way to get it and to remedy the evil is for this country to withdraw from any alliance with European nations regarding treaty compacts, and, without allowing any interference or dictation from any foreign State, to make open, just and fair commercial treaties with Japan. The time was when the carrying trade of the United States and its net tonnage were equal to that of any other nation of the world. It is time for us to regain our lost position. One of the avenues for the accomplishment of this end is to gain control of the commerce of the Pacific, and nothing can more help us in this attainment than to establish a foothold in Japan. That country feels very friendly to the United States. It admires our institutions and seeks to imitate our customs. The country has wonderful resources and is rapidly adopting all the needs and requirements of civilization. It will not be many years before Japan will require millions of dollars' worth of the products of America and Europe, and the proposition is certainly not to be disregarded or sneered at whether we shall control and master this commerce or no. The surplus product of the United States will find a magnificent market there."

The Daft motor for the Ninth avenue elevated railroad weighs 9¼ tons, and is only one-half as heavy as the elevated locomotives. The generator, which is in Fifteenth street, west of Ninth avenue, is connected by a wire to the railroad track. The current passes through the line of rails until it reaches the motor, where it passes, by way of the wheels, to the receiving dynamo.

The National Board of Steam Navigation convenes at the Hoffman House, in this city, on the morning of September 8. Owners of steam crafts on the high seas, gulfs, rivers and lakes or any navigable water of the United States are eligible to membership in this board, which is gradually renewing its vitality.

M. Cogordon goes as special French envoy to Pekin for the purpose of negotiating a treaty of commerce with China. The draft of the treaty provides that traffic on the frontier of Tonquin shall be free of duty, and that there shall be no special privileges for traffic at treaty ports.

The assurance comes from Washington that mails sent from New York by way of Tampa, Fla., to Havana reach their destination 24 hours earlier than if sent direct by steamer from New York; but they don't.

A firm in Manchester, England, has contracted for materials for the construction of a railway from Takou, at the mouth of the Hoen-Ho, on the Yellow Sea, to Tongchow, on the Pei-Ho, an affluent of the Hoen-Ho, at a point about 25 miles east of Pekin. The railroad will be about 100 miles long, and will give Pekin a direct and easy communication with the Yellow Sea. The road is to be built and operated by the Manchester firm with Chinese labor and capital.

The largest casting ever attempted in Italy is reported to have been recently successfully accomplished at the iron works of Signor Gregorini, of Levere, on the Lake of Isso, in Lombardy. The block measured 494.43 cubic feet, and was cast in 23 hours. This mass of cast iron, weighing something like 105 tons, is intended for the anvil of a 10-ton steam hammer in course of construction for the royal arsenal at Spezia.

Spain has already lost 70,000 of her people from cholera this year, and from the present rate of progress of the disease it cannot be doubted that the appalling total of 100,000 will be reached before its ravages are stayed.

It should be a matter of pride to the people of the United States to know that within their boundaries is the deepest vertical shaft on the American continent, and the second deepest in the whole world. This is what is known as the "Combination Shaft," on the Comstock lode at Virginia City, Nev. It is being sunk by the Chollar-Potosi, Hale & Norcross and Savage mining companies; hence its name of the "Combination Shaft." This shaft has now reached a perpendicular depth of a little over 3100 feet. There is only one deeper vertical shaft in the world—the Adalbert shaft of the silver-lead mines of Przibram, Bohemia, which at last accounts had reached a depth of 3280 feet. It is expected that a much greater depth will be attained by means of a smaller shaft and the use of compressed air.

The fecundity of Southern negroes is attracting more attention. Between 1870 and 1880 the white population of the United States increased from 33,592,245 to 43,402,970, or 29.20 per cent., and the colored population from 4,886,387 to 6,580,793, or 34 67 per cent. Yet the colored people, unlike the whites, gained nothing from immigration.

Consul Brent, at Callao, Peru, has reported to the State Department that negotiations have been commenced for the construction of a railroad from Aroya to Cerro de Pasco, for the purpose of reaching the celebrated silver mines at that place. Prior to the present century the mines were worked for a King by enslaved Indians, and are said to have yielded $400,000,000. The Peruvian Government has entered into contract with a syndicate, of which Mayor Grace and Michael Grace, of New York, are said to be members, which, with a capital stock of $15,000,000, is to work the mines for a part of the profits.

Official reports to Washington represent that Buttermilk Channel, which forms one of the principal approaches to New York City, has been dredged under Congressional appropriations to the depth of 24 to 26 feet, but it is evident that the width is not yet sufficient and that the removal of the entire shoal may be necessary.

A steam dredge built on the Clyde to dredge for phosphate in Beaufort Harbor, S. C., was sunk in a hurricane off Bermuda, and all hands lost. She cost $150,000.

Half a dozen oyster-canning establishments have suddenly sprung into existence between New Orleans and Mobile, and find a rapid demand for their products.

A laborer in the Pennsylvania Steel Works, at Harrisburg, fell into the blast furnace and was instantly reduced to a cinder.

Japan is having hard times, financially speaking. Prices of silks have fallen lower than ever before, and the tea crop is said to be smaller than that of last year.

Lumber dealers in the Northwest have advanced prices $1 per 1000 feet on all grades of lumber.

The nine story granite building just completed on Broadway for the Standard Oil Company is supposed to have solved the problem of ventilation. One hundred exhaust flues run through the structure, through which air is forced by means of two 7-foot exhaust fans at the rate of 1,500,000 cubic feet an hour.

At Indianapolis a manufacturer is turning out log wagons for service in the mahogany woods of South America. Each weighs 2500 pounds and is up to a 10-ton load on a rough road; the wheels have tires 4 inches wide and 1 inch thick, and the motive-power will be ox teams of from 8 to 20 yoke.

The new steamship Etruria, of the Cunard Line, carries the broom, having just made a trip from Queenstown to New York in six days and five hours. Following is a table of the runs made on the different days:

	Miles.
Liverpool to Queenstown	240
From leaving Queenstown to noon, August 17	424
24 hours to noon, August 18	464
24 hours to noon, August 19	450
24 hours to noon, August 20	465
24 hours to noon, August 21	464
24 hours to noon, August 22	465
From noon to 8.35 p. m., August 22	71
Total	3,043

Distance from Queenstown to Sandy Hook, 2803 miles; actual time, 150 hours; average per hour, nearly 19 miles. The average hourly run of certain days was over 19 miles.

Not less than 6000 men are toiling underground on the new aqueduct which is to supply New York City with water, many of them employing powerful steam drills in rock excavation, and two years hence a tunnel 31 miles in length will be finished between Croton Lake and Central Park. On the whole line there are 26 shafts. The sub-contractors are under agreement to tunnel out the rock in their respective sections at so much a yard, and to build the brick and stone waterway inside of it at set prices. At the bottom of each shaft the miners work in two directions, so that while one set of men is drilling southward there is a set of men in another shaft working northward to meet them. These shafts are about a mile apart, and yet so delicate and accurate are the plans of the engineers that in no case, they declare, will the line of the tunnel be more than an inch out of the way when the miners in the different tunnels meet each other underground.

It is now announced that of this year's sugar crop of the Hawaiian Islands, estimated at 70,000 tons, the American Sugar Refinery will collect two-thirds, having made contracts with all the interests opposed to Spreckels' monopoly.

The annex to the Grand Central Depot, in this city, now nearly finished, measures 695 by 110 feet, and is covered by a roof of corrugated iron, supported on one side by iron columns. The style of architecture is similar to that of the old depot. The buildings will be connected underground by a tunnel for the transfer of baggage.

J. B. Wortendyke, the inventor of the machine for making paper twine, and also of the first machine for making kerosene lamp wick, died at his home in Bergen County, N. J., on Friday night, aged 55 years.

The superintendent of the Office of Foreign Mails has been informed by the Mexican postal authorities that a reciprocal exchange of closed mails, via New York, will shortly be put in operation between Paso del Norte, upon the northern border of Mexico, and Spain.

Germany appears to be crowding England in the matter of shipbuilding. Before the year 1866, not only the larger ships-of-war of the German fleet, but even most of the steamers of the German mercantile marine, had to be built in England and France, while now China and Japan order their war ships of German shipbuilders. Three ironclad corvettes, ordered by the Chinese Government, have just left Kiel for their destination.

A grain elevator of 800,000 bushels capacity, and to cost $225,000, is to be built by J. T. Moulton & Son, of Chicago, at Washburn, Wis., for the Chicago, St. Paul, Minneapolis and Omaha Railway Company. For the cribs underneath this elevator about 2,000,000 feet of 12 x 12 timber, 10,000 cords of stone and a great quantity of bolts and other iron will be needed.

Lightning struck a barbed-wire fence at Marian, N. C., July 28, followed the fence for nearly ¼ mile and entered a barn, which it completely demolished.

Two Hungarian strikers lately employed in the Cleveland Rolling Mills are supposed to have drowned themselves on account of poverty.

It is estimated that for this season the sales of twine for self-binding harvest machines in De Witt County, Ill., will amount to not less than 40,000 pounds, or 20 tons, at a cost of $6400.

The new water works at Bismark, Dak., are estimated to cost $100,000, and will not be completed this year.

Eads' ship railway on a miniature scale is being built by an English company, to connect the Bay of Fundy with the Gulf of St. Lawrence. The road will be about a dozen miles in length, sufficient to test the practicability of the system.

The Grant Monument Committee has fixed upon $1,000,000 as the sum it proposes to raise for the building of the memorial at Riverside Park.

Freights on general merchandise by clipper ships to San Francisco are as follows: Pig iron, $5 per ton; machinery, $10; nails, 40 cents per keg.

The iron steam yacht Yosemite, lately owned by Messrs. John Roach & Son, has been sold to Messrs. Hamilton & Cox, of this city. She is 186 feet long and draws 14 feet.

Dr. Mortimer Ricardo, of Caracas, Venezuela, has completed a ten years' contract with his Government for the exclusive privilege of furnishing coal to all Venezuelean ports. Hitherto this contract has been held by an English firm, and all the coal used was sent from England. About 100,000 tons are consumed annually. Pennsylvania and Maryland will be drafted upon to supply the coal needed, and the first shipment to Venezuela will be made about the 1st of September.

The Southern lines of steamers plying between New York and Gulf ports are receiving offers of freight beyond their capacity, indicating a more active trade in that direction, after a dull summer.

The German corvette Augusta has been sunk in the Red Sea by a cyclone, and 238 officers and men lost.

At an experimental examination of the new electric propelling machinery for the Second avenue elevated railroad, Mr. Stephen Field, the engineer in charge, stated that enough power was developed to run the Great Eastern. The apparatus will be placed under each car, but the system thus far does not command full confidence.

Constructor Pook, at the navy yard in Brooklyn, has engaged a large force of mechanics, whose wages are regulated as follows: Plumbers, $3 50 per day; shipwrights, $3.26 per day; ship joiners, boat builders, calkers and painters, $3; laborers, $2 and $1.76 per day; foremen, $5 per day.

Six old naval vessels recently purchased from the Government by Stannard & Co., on account of their value as old metal, were accidentally destroyed by fire near Port Washington, L. I., and sunk. Loss about $100,000.

The first British tramp steamer in search of cotton this season has arrived at Savannah.

Machinery for the manufacture of "bitite" insulated wires has been erected on an extensive scale in Newark, N. J., and the president of the company concerned declared last week to a number of professional visitors that the bitite invention had put an end to the talk about the impossibility of putting arc-light wires underground with safety.

Thirty salt wells are about to be sunk at Rock Glen, N. Y., making the largest salt works in the State.

A Mrs. Lyles, of Washington City, was scratched on her hand by a composition water filter, apparently made of brass and zinc, and soon after died.

The new directory of Cleveland, Ohio, contains 70,504 names. From this the Cleveland *Leader* figures out a gain of 61,360 since the last census, and estimates that the population of that city will be 300,000 in 1890.

The common impression that the rainfall is steadily decreasing is utterly disproved by the record. The average in the city for the whole 48 years ending with 1883, as reported by the Government Signal Office, was 45.36 inches, and the rainfall of 1884 was 55 34 inches, being 10 inches above the average for the previous 48 years, and 13.38 inches above the average for the 16 years beginning with 1836. In fact, 1884 gave us the heaviest fall of rain we have had for 15 years.

Arrangements have been completed for a Southern Forestry Congress to assemble at Defuniac Springs, Fla., in December, with the object of the protection of valuable Snuthern wood lands and the encouragement of tree culture. The Governors of all the Southern States will attend this congress.

News comes from London to the effect that Russia and England have agreed upon terms for the adjustment of the Afghan frontier.

Considerable interest has recently been manifested at Berlin in the question of the development of the German deep-sea fisheries, and it is reported that a grant of 100,000 marks toward this object will appear in the next budget.

It is stated that wages for coal mining have not been so low along the Monongahela for years as at present.

The Pennsylvania Railroad Company are introducing steam steering gear in the ferry-boats which ply between Jersey City and Courtland and Desbrosses streets, this city.

Another line of steamers between New York and Cuba, via Savannah, to go into operation about Jan. 1, is in contemplation, under what is known in Savannah as "the Plant system."

The chainmakers of Stafford and Worcester, England, have resolved to strike for an advance of 20 per cent. in their wages.

The Okeechobee Land Company, generally known as the Disston enterprise, are progressing very favorably. By the removal of obstructions, by the enlargement of natural waterways, and by the construction of drainage canals, a reduction of several feet of the water level of the Okeechobee Lake has been effected, and so far about 1,125,000 acres of heretofore submerged land have been reclaimed, which, by the improved waterways, may now be reached 250 miles inland by steamboats from the Gulf of Mexico. The soil of this bottom land is a homogeneous heavy rich loam, largely composed of humus in depths varying from 3 feet to 10 feet, and well fit for immediate cultivation. Preliminary experiments in raising sugar-cane on the recovered lands indicated that there is a highly encouraging prospect for the sugar industry of Florida.

Sixty-five per cent. of the coastwise tonnage engaged in the coal trade is pledged to the rules of the Vessel Owners' and Captains' National Association.

A public trial of automatic freight-car couplers will take place at Buffalo on September 15, under the auspices of the Master Car Builders Association.

The South American commissioners are preparing their final report, which will be transmitted to Congress by the President, along with the 11 special reports upon the different countries which have been forwarded from time to time to the Secretary of State. It was the practice of the commission at all the cities visited to invite before them the prominent merchants who were supposed to be friendly disposed toward the United States, and to secure from them all the information possible relating to the trade of their own countries with the United States and its commercial rivals. Inquiry was also made as to the resources of the country, the peculiar demands of the markets, the character of the goods most saleable and how they should be prepared for shipment, the systems under which trade was conducted, and the means by which merchants of other countries had built up the enormous business that they enjoy. At each of the countries visited the commission held official conference with the Governments, which were attended usually by the Presidents and their Cabinets, and certain topics which the commission was instructed to submit on behalf of the United States were discussed and opinions thereon obtained. The reports to Congress will make 2000 or 3000 printed pages, including the information furnished by the 250 or more merchants interviewed. The commission have been constantly employed since the 13th of last September, when they met for organization in New York, have traveled 32,000 miles, and officially visited nine different countries. The commission report that a great deal of interest was shown everywhere in South America in their work, and even in Chili, where the Government did not show much cordiality toward the United States, the citizens were hospitable and the merchants did everything in their power to facilitate the commission's work.

Mexican finances promise no better. A dispatch from the capital, dated August 22, says: "It is not probable that the Government will do anything toward resuming payment of subsidies during the current year. In order to bring the public treasury into condition to meet the first installment of interest on the consolidated debt due July 1, 1886, the Government is enforcing to the letter the economies decreed in June as to the suspension of subsidies. The Government will pay them when it has accumulated a sufficient sum over and above what is required for the payment of the interest on the floating and consolidated debts."

A rich field of iron ore, coal and lumber in Pennsylvania will be opened to the New York market by the completion of the Cresson branch of the Pennsylvania Railroad on November 1.

The negotiations between the flint-glass manufacturers and workmen of the Ohio Valley have been broken off, and a settlement of the dispute seems now as far off as it was when the strike began.

Only two safe lock and vault manufacturers put in bids for the award of a contract during the present year, other firms alleging that the specifications did not permit intelligent competition.

Traffic through Hell Gate is expected to increase rapidly after the great explosion of Flood Rock, early in October.

A walnut tree purchased the other day in Straley County, W. Va., for $250, was cut into four logs and sold in New York for $1600.

The ship channel at Houston, Tex., on the Gulf of Mexico, is capable of being deepened for the passage of the largest seagoing vessels.

Naval vessels at New Orleans are about to load up with $5,000,000 in silver for New York, if quarantine regulations permit.

The recent conference of professed sanitarians at the Fifth Avenue Hotel having recommended that all rags should be disinfected before admittance to landing, Dr. Smith, health officer here, has undertaken, on his own responsibility, to put the recommendation into force, even though the rags come from a district in which no contagious disease is prevalent. In an appeal to the Commissioners of Quarantine, De Castro & Co., importers, testified that the cost of disinfection by the superheated steam process was $5 per ton of 2000 pounds, and $1.20 for two lighterages. The bales averaged 850 pounds, compressed into a space of 32 to 34 cubic feet. During 20 years the house had imported about 100,000 bales of rags, and they had never heard of a case of disease carried by them. Practically there was but one way of disinfection—by this patent steam process; the sulphur process would cost as much as the rags were worth. The charges now levied are a serious tax upon the commerce of the country.

The United States consular service in China and Japan is to be thoroughly investigated by the new ministers. Several consulates of the lesser grade will be changed.

The action of the Treasury Department in reference to Mr. Starin and the Barge Office will not be reconsidered.

The great Northwest is booming ahead. According to the Federal census of 1880, the cities of St. Paul and Minneapolis, respectively, had 41,473 and 46,887 inhabitants. To-day the figures are in round numbers 111,000 and 129,000. The center of the population of the United States, which in 1880 was close to Cincinnati, has since been moved a considerable distance toward British Columbia.

THE IRON AGE BOOK DEPARTMENT.

Drawing and Designing.

Rose.—Mechanical Drawing Self-Taught. By Joshua Rose; 330 engravings, 313 pages, 8vo, cloth; $4

This work will be found to be thoroughly adapted to the practice of American machinists. It comprises instructions in the selection and preparation of drawing instruments, with elementary instruction in practical mechanical drawing. The illustrations give examples in simple geometry and elementary mechanism, including screw-threads, gear wheels, mechanical motions, engines and boilers.

Practical Lessons in Architectural Drawing. By Wm. B. Tuthill; 33 full-page plates and 33 woodcuts, 44 pages, descriptive letter-press, 8 oy 12½ inches, oblong, cloth; $2.50

This work embraces scale drawings of plans, elevations, sections and details of frame, brick and stone buildings, with full descriptions and a form of specifications adapted to the same. The drawings are clear and thorough, and so detailed as to show the whole construction. The book contains a greater fund of knowledge than many of the practicing architects of the day possessed when they first entered the profession. It is purely practical, and will be useful to the carpenter, joiner or student.

Hulme.—Mathematical Drawing Instruments, and How to Use Them. By F. E. Hulme; 152 pages, 8vo, 61 illus., cloth. . . . $1.50

This is one of the best works upon drawing instruments now in the market. Although originally intended for the English reader, it is no less valuable to those who live in America. This work is not only a thorough treatise on the various instruments used in drawing, but includes instructions in regard to drawing and tracing papers, how to trace and how to copy drawings two or more at one time, and the use and application of colors to represent different materials, making in all a valuable work for the experienced draftsman as well as for the student.

Principles of Perspective. By Henry Lewis, B. A.; 60 pages, 4¾ by 7 inches, 10 full-page lithographed diagrams, paper. . . $0.40

This work gives in a small space and simple language the leading points in perspective, and illustrates the lessons with clear and well-engraved diagrams. It is a textbook which has been highly commended. Both parallel and angular perspective are treated in a progressive manner, and the examples are of such a character that they can be worked out with the aid of a foot rule, a pencil and a pair of compasses

Monckton's Practical Geometry. By James H. Monckton, Instructor of the Mechanical Class in "The General Society of Mechanics' and Tradesmen's Free Drawing School" at New York City. Illustrated by 42 full-page plates; 97 pages, 12mo, cloth. $1

This is a well-arranged series of geometrical problems for mechanics and students Each problem is accompanied by its explanation upon the opposite page. The necessary instruments, tools and materials for drawing are described and their uses explained. The problems include all likely to be required by any class of mechanics.

Orthographic and Isometric Projection. By Ellis A. Davidson; 144 pages, 4 by 6 inches, illustrated by 49 plates, limp cloth. . . . $1

This is a cheap and very satisfactory work relating to the subjects indicated by its title.

Architectural Designs, Plans and Details.

Cottages, or Hints on Economical Building. Compiled and edited by A. W. Brunner, architect; 24 plates, contributed by different New York architects, and 54 pages of text, 8vo, cloth . . . $1

A number of designs and sketches are presented, in this little book, of medium and low cost country houses adapted to meet the ideas of those wanting inexpensive homes, which at the same time shall be picturesque and convenient. The first four plates show designs of very simple cottages of from four to six rooms, costing from $600 to $1000. In plates V to X the designs embrace cottages of slightly larger size, with three rooms on the first floor, the estimated cost not exceeding $2000. Plates XI to XIX includn various designs, all differing greatly in play and exterior treatment, yet keeping strictly within the range of medium-cost houses. The list four plates give designs for double of semi-detached houses. The descriptive text includes practical suggestions for cottage building. A chapter by Wm. Paul Gerhard is added upon the water supply, drainage sewerage, heating, ventilation and other sanitary questions relating to country houses.

American Cottages. Consisting of 42 large quarto plates, bound in cloth, one volume, 4to; . $5

Containing original designs of medium and low cost cottages, seaside and country houses, Also, a schoolhouse, club-house, pavilion and a small seaside chapel, together with a form of specification for cottages, all in the latest prevailing styles, from the drawings of a number of prominent architects, thus securing a great variety of plans and diversity of treatment, and offering the largest opportunity for selection.

Modern Architectural Designs and Details. 10½ by 14 inches, 80 full-page lith. plates, cloth . . $10

This work, which was published in parts during 1881, is the latest addition to the designs adapted for use among builders and architects, and is about the only volume which has given attention to the modern features of architecture which have appeared during the past few years. The drawings presented are from prominent architects of New York, Boston and other localities, and all the designs given are original in this work. Queen Anne, Eastlake, Elizabethan and other modernized styles are presented. A number of low-priced cottages, adapted to the requirements of the seaside and summer resorts, are included.

Interiors and Interior Details. With an Introduction, Description of Plates, and Notes on Wood Finish. By William B. Tuthill; 52 plates, 10 by 13½ inches, cloth; $7.50

This work presents the principles which underlie successful interior finish and decoration. Some of the most able architects of New York, Boston, Chicago and Providence have contributed to its pages. It contains original designs of halls, staircases, parlors, libraries, dining-rooms, &c. There are also special designs in perspective, elevation and detail for low cost, medium and elaborate; furniture, sideboards, wood mantels, wood ceilings, doors and windows, wainscots, bank, office and store fittings. The suggestions are valuable, not only to architects and designers, but equally so to carpenters, builders and mechanics.

Public Buildings. By A. J. Bicknell; 10 by 14 inches, 21 full-page plates, cloth $2.50

This book contains plates Nos. 90 to 108 and Nos. 133 to 135, inclusive, of "Wooden and Brick Buildings," showing libraries, town hall, masonic hall, hotels, opera house, court house and railway stations, including numerous details of same, with descriptive letter-press.

Construction and Materials.

Practical Carpentry. By F. T. Hodgson; nearly 300 illustrations; 144 pages, 12mo, cloth . . . $1.00

The first part of this book is devoted to such problems in geometry as are of special importance to carpenters and builders. Following this the subjects of arches, centers, windows, doors and roofs are considered. Numerous rules are introduced for the calculations necessary to be made in roof framing, and the accompanying diagrams show how the cuts in the timbers employed are obtained. Mitering, joints and jointing, dovetailing, sash and skylights, raking, molding and circular work are all thoroughly discussed and explained. Useful rules and tables for estimating are included.

Plasterers' Manual. By K. Cameron, revised edition, 67 pages, 4½ by 6⅞ inches, 10 illustrations, cloth; $0.75

This book contains descriptions and illustrations of tools and materials used in plastering; also a description of the appearance and action of every variety of lime and cement, with instructions for making all kinds of mortar, and for doing all kinds of plain and ornamental plastering. It also has a chapter on cistern building, contains a form of contract, numerous useful tables, recipes, &c

American House Carpenter. By R. G. Hatfield; 685 pages, 6 by 9½ inches, 450 illustrations, cloth . $5

The first part of this book, embracing some 300 pages, is architectural and mechanical in character. The divisions are architecture, construction, stairs, doors and windows, moldings and cornices. Approved construction is presented, with illustrations of the principles upon which they depend. Strains and thrusts, and the best means of providing necessary strength, are presented in an intelligent and comprehensive manner. Simple formula is freely used, but in such a way as to make its presence no disadvantage to the book. The second part is mathematical In character, the subjects being geometry, ratio and proportion, fractions, algebra, polygons, circle, ellipse, parabola, trigonometry, drawing and shadows. An appendix contains a glossary, tables of squares, cubes, &c., and a comprehensive index. The work is standard in character, and is alike valuable to the architect, engineer and common mechanic.

Modern House Carpenter's Companion and Builder's Guide. By W. A. Sylvester. 3d edition, enlarged, 45 full-page plates containing 109 illustrations, 210 pages, 12mo. cloth $2

This is a well-arranged hand-book for carpenters and builders. It contains rules for getting the lengths and finding the bevels for rafters for pitch, hip and valley roofs; the construction of French and mansard roofs; several forms of trusses and stairs, splayed and circular work, &c.; a table of braces, sizes and weights of window-sash and frames for the same; a table of board, plank and scantling measure; rules for estimating the sizes and capacity of bins for grain, potatoes, coal, &c., also rules for tanks to hold from 5 to 100 gallons; weights and strength of various materials. There is a brief treatise on the use of the slide rule, and there are tables of the diameters, circumferences and areas of circles, rules and examples in simple and compound proportion, square and cube root, mensuration and the metric system of weights and measures.

The Slate Roofer. By D. Auld, Jr.; pocket size; 50 pages with 29 colored plates. $1.00

It is not too much to say that this handy little volume is the best work on slate roofing that has been published. It begins with a discussion of the buildings which are adapted for receiving slate roofs, and considers the sizes of slates most suitable for roofing, together with rules for measuring slate roofing and directions for flashing and counter-flashing. Following this, a number of slate tables are given, arranged in convenient form for builders and roofers. Diagrams are included, showing the use of cut slate, and greatly facilitating the calculations necessary to be made in working slate into ornamental patterns, where both colored and cut slates are employed. These diagrams cover not only fancy patterns, but also letters and figures. Illustrations of a complete outfit of slaters' tools are a feature of the book. Any builder, by a careful perusal of this book, may become familiar with the art of laying slate to the best advantage.

Foundations and Foundation Walls. By Geo. T. Powell; revised and enlarged; 64 illustrations, 166 pages, 8vo, cloth. . . . $2

Contains practical explanations of the various methods of building foundation walls for all kinds of buildings. The present edition has much new matter. There are tables of the weights of materials, the kind of materials used, the loads sustained and the sizes of wall, piers, &c. The chapter devoted to the subject of pile-driving and the use of piles in foundations is very complete. The composition and uses of mortars, limes, cements, concretes, stuccos, &c., are thoroughly explained, and there are instructions upon stone-cutting, masons' and stone-cutters' tools, the construction of arches and chimneys; extracts from the New York Building Laws, with notes, are included, and a treatise on foundations be Frederick Baumann, which is added to the work, gives practical illustrations of the methods of isolated piers as followed in Chicago.

Universal Stair-Builder. By R. A. Cupper; 29 plates, cloth . $2.50.

This is one of the cheapest books in the market on the subject, and for that reason, and also on account of its merits, has had an extensive sale. Several new methods are presented which are of interest to stair-builders, among which may be mentioned a new plan for sawing the twist part of any hand-rail square from the face of the plank and to a parallel width. Also a new method for forming the easings of the rail by a gauge. Practical problems in geometry are introduced in explanation of the principles upon which the methods depend.

Tools and Machinery.

Smith.—Cutting Tools Worked by Hand and Machine.—By Robert H. Smith; 14 folding plates and 51 illustrations, 224 pages, 16mo, cloth. London. . . $1.50

The avowed object of the author of this book is to guide the mechanical student, so that he may judge whether a tool be good or bad and also to enable him to design new tools scientifically. With the exception of screw-cutting tools and files, all the important tools and machines for wood and metal are treated upon, including chisels, hand and machine planes, saws, lathes and machines for boring, drilling, punching, shearing, &c. There are also many valuable suggestions showing the possibilities of making improvements in cutting tools. The mechanic and machinist will find this little book of great practical value.

Manual of the Hand Lathe. By Egbert P. Watson; 134 pages, 5 by 7½ inches, illus. with 78 engravings, bound in cloth . $1.50

This work describes and illustrates the foot lathe and the tools employed in connection with the same. It has a chapter on metal spinning, one on ornamental cutting, another on centers, and one on fancy turning. The subject of wood turning is also considered, including remarks on timbering, tools, &c. The book is useful to all who are engaged in any occupation requiring the use of the lathe.

Rose.—Complete Practical Machinist. By Joshua Rose; 13th edition, revised and in great part rewritten, 356 illustrations, 439 pages, 12mo, cloth. . . . $2.50

This is a handbook of lathe and vise work, with descriptions of the various tools and processes employed. It embraces drills and drilling, hardening and tempering, taps and dies, together with instructions for the making and using of tools. Attention is given to milling machines and tools, and directions for calculating the speed of wheels and pulleys are presented. Various kinds of pumps are described, and the slide-valve is treated, with directions for setting the same.

Hand Saws; Their Use, Care and Abuse.—How to Select and How to File Them. By F. T. Hodgson; 75 illustrations, 96 pages, 12mo, cloth. $1.00

This book is a compilation of articles selected with care and good judgment by the author, and in a cheap, convenient form contains much valuable information and useful suggestions for the carpenter and builder. The contents include the history of the saw, philosophy of the cutting qualities of saw teeth, how to use hand saws, filing and setting hand saws, the use of miscellaneous saws, remarks on files, sets and other appliances, and memoranda on saw gauges, miter boxes, &c.

Heating, Ventilation and Drainage.

Gerhard.—Hints on the Drainage and Sewerage of Dwellings.—By Wm. Paul Gerhard; 282 illus., 302 pages, 12mo, cloth . . $2.50

To all persons interested in healthy homes, whether they are planning new houses or altering old ones, this volume will commend itself. Books of this class should also be in the hands of every professional builder, and plumbers especially will find contained in these pages not only the practical information required for the details of their trade, but also much that they should know to make them competent in their work, and to prevent them from making the too frequent careless or stupid mistakes which result from bungling work. The book is divided into twelve chapters, the headings of which are as follows: Fresh Air versus Sewer Gas; Necessity of Ventilation in Rooms Containing Modern Conveniences; Defective Arrangement of Plumbing Fixtures; Soil and Waste Pipes as Usually Found in Dwellings; Traps and Systems of Trapping; Details of Traps; Insecurity of the Common Water-Seal Traps; Defects in the Plumbing Work of Dwellings; Cellar Drains and Drainage of Cellars; Usual Defects of House Drains; Sewer Connections, Privy Vaults and Cesspools; System of Internal Sewerage as it should be in a Dwelling; Plumbing Fixtures; Removal and Disposal of Household Wastes. The chapter on Plumbing Fixtures is very complete, and the numerous illustrations add greatly to the value of the book.

Baldwin.—Steam Heating for Buildings. By Wm. J. Baldwin; 4th edition, with many illus. plates, 234 pages, 12mo, cloth; . . $2.50

This book is one of the most practically valuable that has appeared in a long while. It is especially adapted to steam-fitters, and contains directions for piping buildings and setting boilers properly, with descriptions of the most approved forms of apparatus for warming and ventilating private houses and large buildings, and for cooking purposes. There can be no opportunity for bungling work if the mechanic is familiar with Mr. Baldwin's excellent plans and suggestions.

Mott.—The Air We Breathe, and Ventilation. By Henry A. Mott, Jr.; illustrated, 81 pages, 16mo, cloth. $1

In the first part of this little book the constitution of the air is considered, and its impurities are shown and discussed. The second part includes the subject of ventilation. Several different systems are described in detail, and their merits and faults pointed out. The "aspirating" system is presented by the author as that on which the correct principles of ventilation are based. The illustrations show the application of the principles advocated for the ventilation of private and public buildings, railway cars, &c.

Iron, Steel and Metallurgy.

West.—American Foundry Practice. By Thomas D. West; illustrated, 391 pages, 8vo, cloth $2.50

A practical treatise on the management of cupolas and the melting of iron. The author, a practical foundryman, treats of the molder and his trade, green-sand molding; loam and dry-sand molding, and the manipulation of iron castings. The work is a valuable addition to the list of books upon this subject.

Bauerman.—Metallurgy of Iron. By H. Bauerman; 5th edition, revised and enlarged, 58 illustrations, 515 pages, 12mo, cloth . . . $2

This work treats of the physical properties of iron ores, and the most approved means of reducing them to the purposes of the manufacturer. The methods of assay and analyses of iron ores are practically considered, as also their composition and distribution. The subject of blast furnaces, their capacity and production, has also received careful attention. In the present edition the author has added to the chapter on Steel Making, and has explained and illustrated the progress recently made in the process of steel manufacture, both of Siemens and Bessemer, especially the latter, by the adoption of lime as a dephosphorizing agent. The book also contains a chapter on the mechanical properties and tests of Malleable Iron and Steel. The author has succeeded in his avowed attempt to supply much practical and reliable information for ironworkers and others, in condensed form.

Graham.—Brass Founders' Manual. By Walter Graham; numerous illus., 141 pages, 12mo, cloth. London: (Weale's series). . $0.80

This little volume contains instructions for modeling, pattern making, molding, alloying, turning, filing, burnishing and bronzing. Copious recipes and tables are presented, together with notes on prime costs and estimates. Although designed for English practice, it contains many suggestions valuable to brass founders in this country.

Ricketts.—Notes on Assaying and Assay Schemes. By P. De Peyster Ricketts, Ph.D., Instructor in Assaying in the School of Mines, Columbia College, New York; 6th edition, revised and enlarged, illustrated, 210 pages, 8vo, cloth; 1882. . . . . $3

A serviceable manual for the practical as well as the scientific student. It contains chapters on apparatus, reagents and operations, dry and wet assays, with tables and references, and an appendix on blow-pipe analysis.

Watt.--Electro-Metallurgy. By Alexander Watt; new edition, enlarged, 195 pages, 12mo, cloth; 1882 . . . . . $1

A practical work on the electro-deposition of copper, silver, gold, brass, bronze, iron and nickel, with details and processes carefully described. The present edition contains much new matter upon the deposition of nickel.

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The Physical Qualities and the Chemical Composition of Steel.

From a lecture by Mr. Pedro G. Salom, of Thurlow, Pa., before the Franklin Institute, on the "Metallurgy of Steel," we reproduce the following chapters on the physical qualities and the chemical constitution of steel, a subject to which Mr. Salom has given special attention :

There are few subjects that have been so carefully studied as that of the physical nature of steel. The most elaborate investigations and costly experiments have been made, and, although our knowledge has become considerably enhanced by the results obtained, still not nearly so much has been accomplished as these elaborate experiments would seem to indicate, and we are still in lamentable ignorance. When a bar of steel is placed in a testing machine, constructed for the purpose, and actually pulled apart, there are four physical qualities which may be observed :

1. Tensile strength, or the weight per square inch required to break the bar.

2. Elongation or ductility, or the amount the bar has stretched between two given points.

3. Elastic limit, or the weight per square inch that can be applied without giving the bar a permanent set.

4. Reduction of area, or the area at the point of fracture compared with the original area.

The tensile strength and elongation are the important elements, while the elastic limit and reduction of area are a complement or corollary of the first two. The tensile strength of steel varies from 50,000 to 200,000 pounds per square inch, and with it, of course, the other properties vary. No quality of steel is more readily affected by its composition and treatment than its tensile strength. For every employment for which steel is used, steels of various tensile strengths have been tried ; yet, notwithstanding the fullness of the information on this subject, engineers and manufacturers are still unable to agree in some cases as to the proper tensile strength to use.

The elongation or ductility of steel varies from 0 to 33 per cent. in an 8 inch section. It is the greater ductility of steel that renders it superior to the best iron in the construction of boilers, shipplates, fire-boxes, &c. The ductility of steel is in most cases its most valuable quality. Strength without ductility is of little value to the constructing engineer. Tool steel is very strong, but no one would recommend it for boilers. Something that will bend before breaking is the great *desideratum*. Then it is an easy matter to so proportion the structure that no portion of it shall have an undue load or strain. Some years ago the engineers of the Pennsylvania Railroad were surprised to find that some steel bridge rods had broken in service. Samples of the steel were sent to Altoona, and physical and chemical tests made. The result of the investigation proved the anomalous fact that the rods broke because they were too strong ; that is to say, the steel having a very high tensile strength (about 100,000 pounds), would not yield to slight inequalities of mechanical construction, and, therefore, the strain coming on a single point, broke the rods. Had the rods been made of steel with a tensile strength of 60,000 pounds and 15 or 20 per cent. elongation, they would have bent, and thus allowed the strain to come on the whole rod instead of on a single point.

The elastic limit varies from 15,000 to over 100,000 pounds per square inch, while the reduction of area varies from 0 to 70 per cent. The following table will show the physical characteristics of steel made for various purposes by the three methods described above :

	Tensile strength.	R. of area, per cent.	Elongation in 2 inches, per cent.
American tool steel	129,000	...	12
Bessemer steel (for rails)	81,000	....	17
Open-hearth steel (for springs)	143,000	...	6
Open-hearth steel (for boilers)	60,000	65	30 (in 8 in.)

The tensile strength of the best Sheffield tool steel is about 130,000 pounds. Bessemer and open-hearth steel can be made with tensile strengths varying from 50,000 to 150,000 pounds. The physical properties of a piece of steel are greatly influenced by the amount of "work" (rolling or forging) that has been expended upon it. An interesting illustration of this fact was given by Mr. Hunt in a paper read before the Engineers' Society of Western Pennsylvania. An ingot 24 inches in diameter was forged to 16 inches, and test pieces taken from disks, cut from the forging. A part of the forging was reduced to 8 inches square and test pieces taken in like manner from it ; another portion of the same material was rolled into a ⅜-inch plate, and test pieces taken from it. These test pieces were broken in the testing machine, and all being of the same chemical constitution, viz, carbon, 0.28 manganese 0.60, the different results obtained are clearly due to the different amounts of work put on each piece. A piece from the original ingot was not tested, but would have had a tensile strength of about 45,000 or 50,000 pounds, and no elongation. The following are the results of the other tests :

	Tensile strength, pounds.	Reduction. per cent.	Fracture.
16-inch forging	60,000	5	Granular and brittle.
8-inch forging	75,000	14	Less granular.
⅝-inch plate	85,000	18	Fibrous and tough.

The study of chemistry of steel makes us have a wholesome respect for the value and importance of little things. When we come to consider the fact that $\frac{1}{100}$ or $\frac{1}{125}$ of 1 per cent. of carbon affects the tensile strength of a piece of steel, we begin to understand the value of any method by which we may obtain a rapid and accurate knowledge of the amount of this substance present. Moreover, we will understand why the results of the thousands of physical tests that have been made are still unsatisfactory. The incompleteness of these results seems to be more from the manner in which the tests have been made, rather than from any impossibility or inherent difficulty in obtaining the required information. That is, in a vast majority of cases they have been made without regard to the chemical contents of the steel. The physical test will tell us what qualities a certain piece of steel possesses, but it will not tell us why it possesses these qualities. This chemistry will do. What we require in order to have an accurate knowledge of steel is a series of alloys of iron with carbon, phosphorus, manganese, silicon, &c., alone and in combination with each other. We shall then be able to determine the influence of a unit of each of these substances on iron ; our knowledge will be no longer merely empirical, and we will be able to foretell the physical properties of steel with as much accuracy as we do the properties of a substance obtained by a chemical reaction.

The influence of carbon on steel is better known than that of any other substance which enters into its composition. No one, however, so far as I am aware, has done anything more than formulate the general law that tensile strength increases with the carbon, other things being equal. I have made the interesting observation that this increase is almost exactly 1000 pounds for every $\frac{1}{100}$ of 1 per cent. of carbon. That is to say, assuming $\frac{1}{100}$ of 1 per cent. of carbon to be a unit of carbon, then if to 45,000 pounds (the tensile strength of pure wrought iron) we add as many thousand pounds as there are units of carbon, we shall be able to make a very close approximation to the tensile strength. Boiler-plate steel, for example, has about 0.15 per cent. carbon and 15 + 45 = 60, or about the tensile strength of boiler-plate steel. Rail steel has about 0.30 per cent. carbon, and 30 + 45 = 75, or about the tensile strength of rail steel. Again, crucible tool steel contains from 0.50 to 0.85 per cent. of carbon, and these numbers added to 45, 95 and 130, respectively, include the tensile strengths of various kinds of tool steel. Still again, a sample of spring steel tested ta Altoona showed 1 per cent. of carbon ; its tensile strength, therefore, should be 145,000 pounds. Its actual tensile strength proved to be 143,000 pounds. Of course this law only holds good where other things are equal. An undue amount of one or all of the other foreign substances that enter into the composition of steel, or unusual physical conditions, would change the results entirely. It may be of value, however, in pointing out the fact that, when steel with a known amount of carbon does not possess a certain tensile strength, then the other substances entering its composition are present in undue proportion, or it must have been made under unusual physical conditions. The influence of manganese on steel is much more of a disputed question than that of carbon. Some metallurgists believe it to be extremely injurious, while others hold it to be very beneficial. There is no question, however, about its effect on steel, so far as tensile strength is concerned, which increases as the percentage of manganese increases, although not so rapidly as with carbon.

I believe, however, that when alloys of pure iron and manganese are made it will be found that the increase of tensile strength is not due to manganese *per se*, but to its power of causing carbon to combine with the iron. In other words, it has not yet been shown, so far as I am aware, that an alloy of iron and manganese without carbon possesses unusual tensile strength. But manganese plays a dual part ; it not only increases tensile strength, but, in the process of manufacture it reacts powerfully on the oxide of iron which the steel contains, and forms a fusible slag, which, being specifically lighter, rises to the top when the steel is in a molten condition, and thus renders it more homogeneous, and consequently stronger and more ductile. This, however, is only true up to a certain point ; beyond that point the steel gets more and more brittle until 2 per cent. is reached, when the steel is so brittle that a bar or rail can readily be broken by throwing it on the ground. It has recently been discovered, however, that if the percentage is increased to 7 per cent., this brittleness commences to disappear, and the metal, although exceedingly hard, begins to get tough again, and when it is increased from 12 to 15 per cent. the metal is harder than the best tool steel, and almost as tough as boiler plate. I have recently seen a piece of this remarkable steel which had a tensile strength of over 100,000 pounds to the square inch and an elongation of 20 per cent. in 2 inches. The alloy is the invention of Mr. Hadfield, of Sheffield, England, a well known crucible-steel manufacturer. I have been unable as yet to formulate any definite law regarding the influence of a unit of manganese. In order to do this a knowledge of the physical qualities of pure manganese should first be obtained, as no reliable experiments have ever been made to demonstrate these qualities. That it is a matter of the first importance, and of exceedingly great scientific interest, all must admit. It does not seem probable that pure manganese would possess a tensile strength greater than pure iron ; if it does not, must not the increased tensile strength of manganese steels be due to the combined carbon ?

There is a greater difference of opinion regarding the influence of phosphosus than perhaps any other element that enters into the composition of steel. It has been considered by a majority of the best authorities that phosphorus is a hardener. The results of an immense number of tests that I have made point in exactly the opposite direction. I have found that phosphorus in steel acts in the same manner physically as it does in pig iron, and, if I may be allowed the expression, is a "rotter," not a "hardener." But even this generalization has to be somewhat modified, for as far back as 1874 M. Euverte, of Terre-Noire, discovered that phosphorous might be introduced into steel on condition that the proportion of carbon was correspondingly diminished, and that the less carbon the steel contained the more phosphorous might be admitted into it without depriving it of its valuable properties. I believe, however, that this is only relatively true, and that the same metal without any phosphorus is possessed of superior qualities. I haverecently seen some test pieces made by the Clapp-Griffiths process that contained as much as 0.50 per cent. of phosphorus, an amount which only a few months ago (and even now by a large number of steel-makers) would have been considered as rendering steel utterly useless, and yet this same steel possesses more valuable qualities than wrought iron, and can be not only flanged and welded, but will stand being bent double cold without cracking.

The influence of silicon on steel has been but little studied, but in my opinion it has a more injurious effect than phosphorus. We know in a general way that silicon acts in an opposite manner from manganese, and prevents the carbon from combining with the iron. Phosphorus acts in a similar manner, I believe, for it is a well known fact that high-phosphorus pig irons will not "chill"—that is, the carbon will not combine with the iron. Again, we do not know whether silicon is present as silicide or as silicate of iron. Phosphorus, in the same way, might be present as phosphite or phosphate of iron, thus making important physical changes. But silicon possesses the remarkable property of making steel solid. When ordinary low-carbon steel is cast into an ingot it is honeycombed, or full of "blowholes." Now, if we introduce into the steel 0.2 or 0.3 of 1 per cent. of silicon, these holes disappear, and it is possible, therefore, to make steel castings as solid as those made of iron, and with a strength from three to four times as great. At the same time these castings are almost as ductile as wrought iron.

Sulphur and copper make steel red-short, but they are usually present in such small quantities as not to give the manufacturer any serious trouble, and therefore their precise influence has not been so carefully studied as that of other impurities. Thus we see that, our knowledge only being partial, we cannot as yet predict with any certainty what influence various proportions of an impurity has. There seem to be some characteristics about steel, however, that neither chemical nor physical tests will explain—characteristics in connection with its molecular condition, and it is possible in this connection that the microscope will prove an important aid. At all events it is an almost virgin field, and a conscientious microscopic analysis of steel would undoubtedly yield the most interesting results.

The Discovery of Gold in California.

The death of Marshall, the discoverer of gold at Coloma, Cal , has revived an interest in the event with which his name is associated that will hardly be satisfied by the scant and conflicting stories appearing in the newspapers East and West concerning it. Thirty-seven years have passed, and the generations that have come upon the world's stage since that day, and reached the thoughtful, critical age of man, look in our histories and reference books in vain for the precise facts of that interesting episode in the nation's life. The accounts which have recently appeared drawn from the handbooks or furnished by individuals who derived their information from Marshall and his associates differ so materially that even the month in which the gold discovery was made is left by them in doubt. It may help to correct these errors and to appease the new interest which has been awakened if those surviving Californians who were on the ground when the gold was discovered will carefully and soberly set forth the facts according to their best recollections. We shall probably then see that rather less merit attaches to Marshall's part in the transaction which brought to light the hidden wealth of California than many of our writers have represented.

It was my fortune, says a correspondent of the *Times*, to be the editor and printer of the first paper published in the town of San Francisco, and to visit the scene of the discovery of gold with Captain Sutter a few weeks after the fact was made known—before any excitement had been created in the country by the event. The exact date as fixed by Captain Sutter, Marshall and others when the first piece of gold was found at Coloma is January 18, 1848. This is the day observed by the California pioneer societies as their commemorative anniversary of the golden revelation. But it was in April, 1848, before the excitement which depopulated the towns, farms, mills and workshops broke out and the scramble for the gold mines began, so well had Marshall guarded his secret. Our party was the first company of white men to visit the mines after Marshall's discovery. But there were other exploring parties out in quest of the precious metals, and the land was disquieted all through that winter and early spring by reports following one upon another of valuable mineral discoveries in the North. The mill gang to which Marshall belonged had been sent the fall before by Captain Sutter to construct the sawmill and race on the North Fork of the American River, at the place called by the Indians Coloma. I remember printing Sutter's advertisement for mill hands. About the 1st of April of that year the *Star* sent out an extra edition to meet the overland emigration and for circulation in the United States, in which the resources of California were set forth and special attention called to her mineral prospects, discoveries of mines being announced weekly. Silver and quicksilver were the popular expectation, but there was mention made of gold placers known to exist in some of the California mountains.

The circumstances attending the finding of gold at Coloma, as gathered from Captain Sutter and others subsequent to that memorable visit to the sawmill camp are as follows : The mill gang, numbering, as nearly as I can remember, 8 or 10 Western men, were encamped on the hillside to the south of the mill, which was a rude structure in the deep valley at the edge of a bar, upon which at that time the waters of the North Fork, swollen by the rains and melting snow, were rapidly encroaching. There was not a woman in the camp, although it is a tradition that the wife of Peter Weimer boiled the "original lump" of gold in her lye kettle to test the metal. This may have been done subsequent to our visit, however. Work had been suspended on the mill, as we undertood, because the high water had backed up into the tail race. No excavations or repairs were going on and not a man of the gang was at work when we arrived on January 18. Marshall, the most active, nervous and inquisitive member of the party, walking by the edge of the tail race, espied beneath the still, limpid "back water" some shining particles which he first supposed to be mica, but which by their peculiar luster arrested his closer attention and finally caused him to stop and draw them out. They were small and thin and of a pale yellow color, and the thought of a new, perhaps valuable, mineral discovery dawned upon him. He pounded one or two pieces with a stone and found it malleable. Then it flashed upon his mind that the "stuff" was godl. He carried the pieces to camp, and, exhibiting his treasure, asked his comrades if they had ever seen any of that around. They lazily argued with him that it was mica and "fool's gold." Marshall heard all they had to say, but he was obstinate in his convictions, and his faith was not overcome. At the earliest opportunity he took one of the horses and rode down to Sutter's Fort, distant about 50 miles, to lay the matter before his employer.

Captain Sutter informed me that Marshall rode into the fort late at night, splashed with mud, awakened him, and insisted upon the utmost secrecy. He turned the key in the door, and in the most excited manner communicated the news of his discovery, exhibiting 15 or 20 flakes of fine gold in a quill which had been cut from the wing of some large bird, a wooden peg stopping one end of the quill. The stories that have been printed of Marshall's first "find" being a large nugget, which, it is alleged, Marshall himself exhibited several years afterward, can have no foundation in fact, for nuggets (a name borrowed some time afterward from Australia mining terms) were unknown among the early gold discoveries in California that spring. Large pieces of gold were first found later in the year in the dry diggings. It was placer gold that Marshall found, and as such was recognized by Captain Sutter, who had seen the products of placer mining in New Mexico and Southern California. He did not, therefore, attach the value and importance to it which by this time it had attained in Marshall's more excitable mind. The latter claimed, I believe, all his rights under the Mexican laws, which Governor Mason recognized as then in force in California, but proposed an equal partnership with the captain, enjoining upon him the most profound secrecy. Not even the mill hands were to be allowed to participate in his good fortune, and from that hour Marshall bent all his energies to keep the secret from the public. Work on the mill lagged, but no gold mining was undertaken. If Marshall took out any more gold he did it secretly, and no actual gold washing was carried on by his companions.

And this was the state of affairs which we found on reaching the camp at Colma The rumor of a gold mine having been found on the American Fork had reached San Francisco, but similar reports from other parts of the country were common, and it created no sensation. The journey from San Francisco to Sutter's Fort by boat in those days occupied precisely the same number of days that it now takes to cross the continent. We found Captain Sutter at the fort, hearty and hospitable as ever. He would not deny the truth of the gold rumor, and when we announced our intention of visiting the Coloma camp he promptly offered to provide horses and Indian guides and volunteered to accompany us. I have reason to believe this was his first visit to the spot after the discovery of gold. Marshall when approached for information would hardly vouchsafe a civil reply to our questions. He sat in the rude camp, with head bent low, whittling a chip. The two or three men who remained in camp that morning were respectful, but uncommunicative. Major P. B. Reading, an educated gentleman of our party, who had owned a "ranch" in Northern California several years and was an amateur mountain hunter and explorer, borrowed an Indian basket from the camp—one of the pretty, closely-woven grass water vessels which the Indian women of the Pacific Coast tribes are expert in making—and, going to the mill race, gathered some earth and essayed to wash it for gold. The sun's rays were hot in the depth of the little valley, the high hills shutting out the breeze, and the Major labored until he was tired, finding only a few flakes of gold. His estimate of the prospects was briefly stated in the remark that he did not think he had found the value of "a drink" after an hour's back-breaking work. As liquor retailed in California at that time at 12½ cents a glass (*un realé*), we concluded the gold prospect was not hopeful. But in the evening the neighboring tribe of Coloma Indians began to drop into camp, drawn thither by the report that "El Capitan" had come to visit their white neighbors. Around the bright fire that had been kindled—the nights in the mountains being always cool—they gave in reply to the Captain's questions their legends of the gold, one of his native guides, who could speak the Spanish language, interpreting their stories. These Indians said the gold was abundant, but it was bad (*malo.*) It was to be found everywhere in the mountains, but it was guarded by a terrible man-eating dragon. Their people never meddled with it. The dragon's home was in a lake, not far distant, where there was much, much gold. He had been seen there to devour one of their tribe who had molested his treasures.

We listened to these tales until we fell asleep. The next day our party retraced its way to Sutter's Fort. So little impressed were we from all we had seen and heard, with the value of Marshall's discovery, that our talk was rather of silver prospects than of gold. Major Reading carried on his Spanish saddle a blacksmith's hammer with which he would break off bits of rock croppings whenever there was a promise of a trace of silver. We passed on our way down a bar or "island" of the American River, where a week or two later a party from Major Cook's disbanded battalion of Mormons, who had come up from San Bernardino, established a gold-hunters' camp and opened the second "diggings" of the California mines. This spot became famous afterward as Mormon Island. Returning to San Francisco, I found the town not a little excited over extravagant stories that had come down by land of the wonderful riches developed in Sutter's gold mine. Under their influence the few mechanics in the small community were sacrificing the little start they had gained in the conditional grant of a town lot, and the prospect of steady, paying employment, for a chance at the diggings. The *Star* of that week contained an editorial in which the craze was ridiculed as a "fever—a species of yellow fever ; " and workingmen were advised to stick to their calling ; that the pretended wealth of the mines was a sham and a delusion. The article was doubly ridiculous viewed in the light of events which a fortnight later brought about, and under the irresistible effect of which my printers left me to "set up" and "work off" on our little hand press my valedictory to the readers of the *Star*, in which, however, the promise was made (and kept) of resuming the publication of the paper in the fall.

The man whose memory California and the East should honor for the part he bore in the development and discovery of the golden wealth of that State is John A. Sutter, the pioneer and founder of her fortunes. In the divine ordering he was the instrument that brought to light the treasures of her hills. The nation's neglect of his just claims for recompense for valley lands of which he was unjustly deprived was a grevious blunder and a crime. It sent the old pioneer and benefactor to his grave pitifully poor, obscure and broken-hearted, and not a stone has been raised to his memory except in the little churchyard in Pennsylvania where he sleeps.

Steel as a Substitute for Bar Iron.

While rolled steel is gradually taking the place of rolled iron in so many directions, there is one in which it seems as yet to have made little or no progress, and that is, according to Mr. Jeremiah Head, in competition with ordinary bar iron. Makers of this specialty agree in saying that only a very small percentage of their output is as yet of steel, although they are equally willing and able to supply either material. Inasmuch as bar iron is the form in which country blacksmiths and rural implement makers, whether British or foreign, buy most of their material, this is perhaps no more than might have been anticipated. Such consumers have their traditions and their habits, and are slow to change them. Steel they find harder to work, more difficult to weld, and require more care to smith. Above all, it is still substantially dearer. These things are naturally regarded as impediments in country districts, and the superior physical properties of steel are there scarcely appreciated. The blacksmith's customers also are not of the kind to make or enforce rigid specifications ; and so the use of bar iron goes on, and is likely to go on, perhaps for generations. It might have been expected that such extensive consumers of bars as leading makers of agricultural implements would by this time have been found using steel in quantity. But it does not appear that this is so. Occasionally, and for special purposes, such, for instance, as for the wearing surfaces of sledges, steel is used, but not generally. Even for the tires of cart-wheels iron is preferred, because it is more easily welded. An argument is often used which has great weight. It is urged that wherever implements may be made they will sooner or later come to be repaired by the country blacksmith, and that, therefore, the material and construction adopted by the original manufacturer ought to be within compass of the ideas and resources of the rural repairer.

A wire-rod rolling mill in which there are no wabbler connections or gearings between the rollers has been patented by H. Grey and R. Bowater, of Beaver Falls, Pa. The rollers are provided with independent driving pulleys mounted at opposite ends. The different roller pairs are placed in two lines opposite to each other, so that the wire rod may enter the first pair, then pass to a pair in the opposite line, thence in a loop to the second pair on the opposite line, and finally to the last pair on the first line, &c. To produce the proper speed of the various rolls a counter-shaft is mounted in bearings in a pit and carries pulleys which increase in size along the shaft. The pulleys are placed in pairs to register and be connected with the two driving pulleys on each roller pair. Of course the pulleys on the two rollers of a pair may vary in size, and the corresponding counter-shaft pulleys may be proportioned to maintain equal speed of the two rollers of each pair, and the required increasing speed from pair to pair.

An Irish settler who has amassed a hand some independence in the cattle ranches in the West advises all intending Irish immigrants when they reach America to go to Nebraska, Wyoming, Kansas, Ohio, Minnesota, Illinois or Washington Territory. Labor is in great demand, and a workman who would only get $15 a month and board in the Eastern States would get $30 a month and board there. The climate is good, and there are no Irish poor who cannot, by sobriety and industry, attain independence.

Some very satisfactory advices are to hand with respect to the work performed by the Walrand-Delattre converter at the Usines de Stenay (Meuse). In 11 hours there were no fewer than 21 blows, each occupying on an average 14 minutes. The loss in the extra mild steel produced on the occasion was 15.02 per cent. A second converter of the kind will shortly be set up in the same works, and it is also to be introduced at the Larivière Forges (Haute-Viemie), by MM. Jules Noël et Cie.

A congress for codifying and reforming international law assembled at Hamburg, Germany, on the 18th inst. Judge Peabody, of New York ; Sir Travers Twiss, Dr. Wendt, of London ; Dr. Meyer, of Bremen, and Dr. Wolffson, of Hamburg, were elected vice-presidents. The congress has adopted a resolution declaring illegal the insertion of a clause in a bill of lading intended to avoid shipowners' responsibility for seaworthiness or for the negligence of employees.

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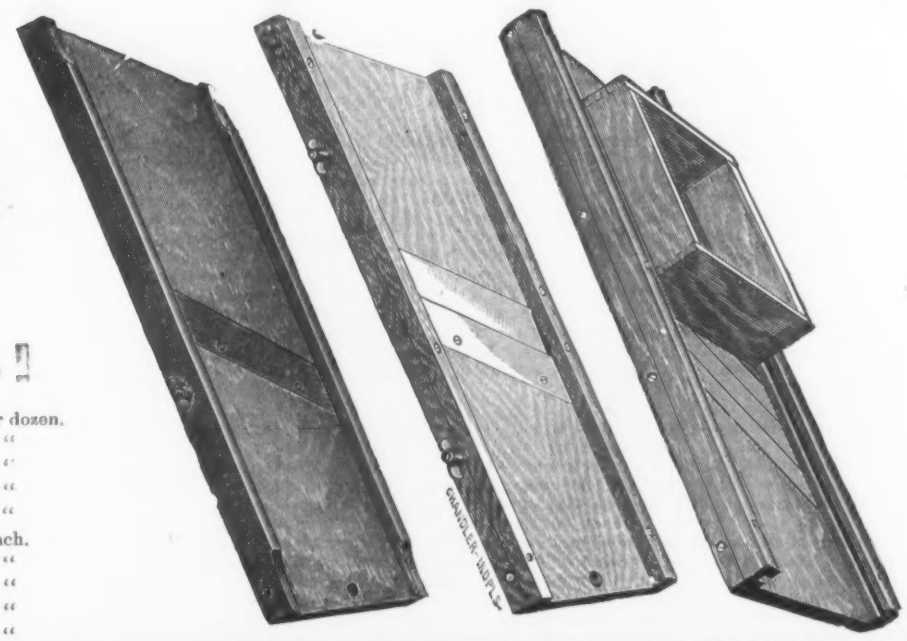
" 3	3 "	"	"	"
" 4	4 "	"	"	"
" 5	3 "	"	9 x 30,	"
" 6	2 "	"	12 x 36	each.
" 7	3 "	"	"	"
" 8	4 "	"	"	"
" 9	3 "	"	12 x 40,	"
" 10	4 "	"	"	"



MANUFACTURERS OF

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"Daisy" Stove Trucks, Rolling Pins,

Hoosier Saw Bucks,

Kraut, Slaw and Vegetable Cut'ers,

Bench Stops, Towel Rollers,

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PATENT LEVEL GALVANIZED SHEET IRON,

And Have No Other.

Absolutely **FLAT** and **FREE FROM ALL BUCKLES.**

EVERY BUNDLE BRANDED **PATENT LEVEL.**

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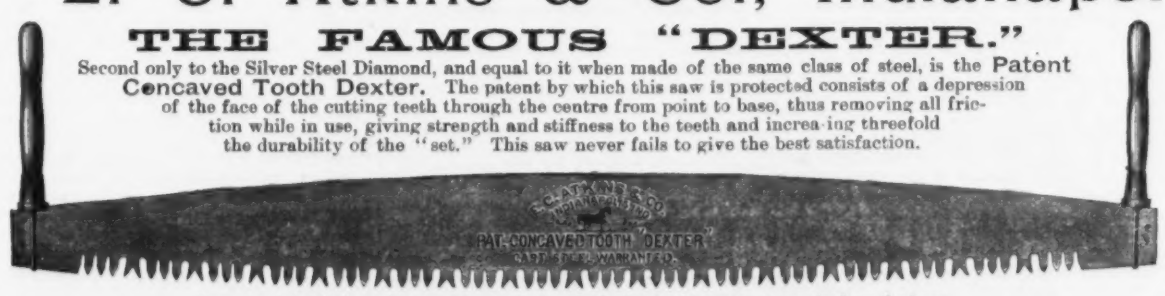
E. C. Atkins & Co., Indianapolis, Indiana.

THE FAMOUS "DEXTER."

Second only to the Silver Steel Diamond, and equal to it when made of the same class of steel, is the Patent Concaved Tooth Dexter. The patent by which this saw is protected consists of a depression of the face of the cutting teeth through the centre from point to base, thus removing all friction while in use, giving strength and stiffness to the teeth and increa ing threefold the durability of the "set." This saw never fails to give the best satisfaction.



Ground substantially uniform gauge on the toothed edge, and any gauge required on the back.

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Cross-Cut, Circular, Band and Gang

SAWS

Are Everywhere Recognized as the

Standard of Excellence.

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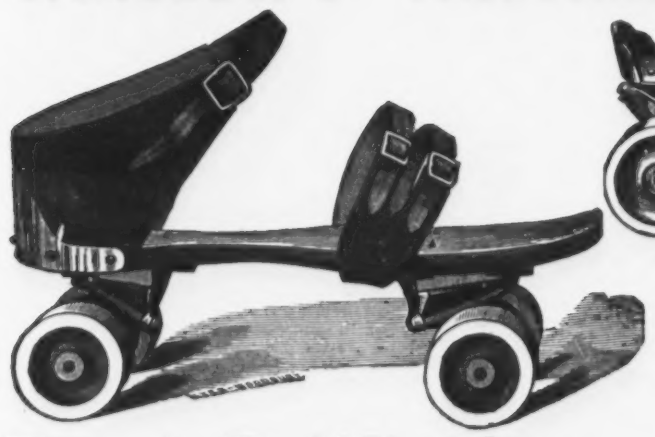

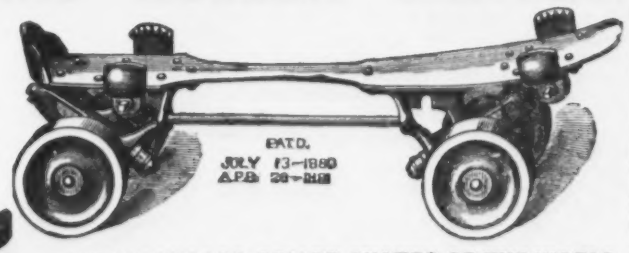

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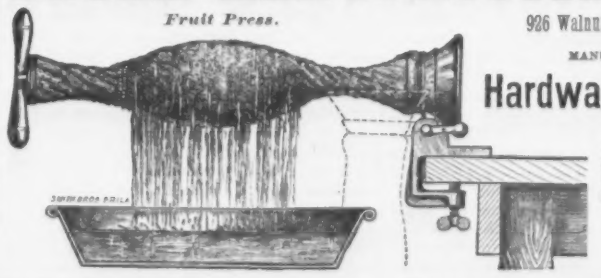

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Now is the time to make money handling these goods. Don't wait till every store has them.

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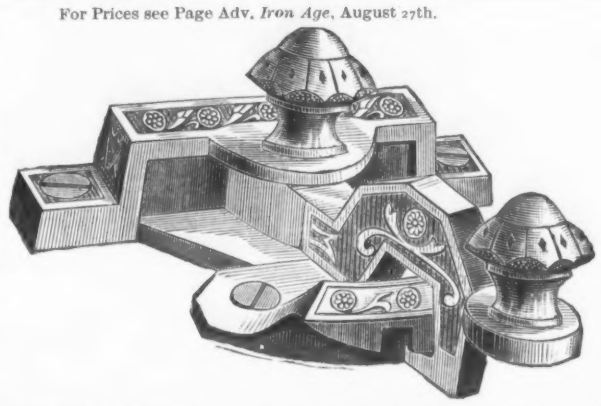

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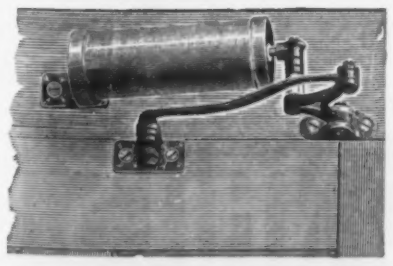
GREAT REDUCTION IN PRICE.



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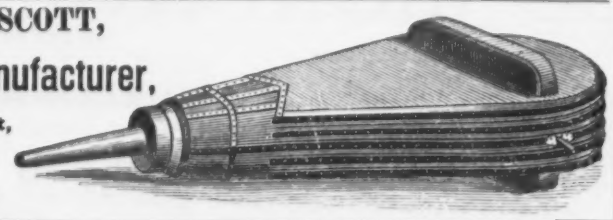

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Cost of Apparatus greatly reduced. *Surveys and Estimates by experts.*

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Ball Bearing and Ratchet Movement.
Most Easy for Beginners. Best for Experts.

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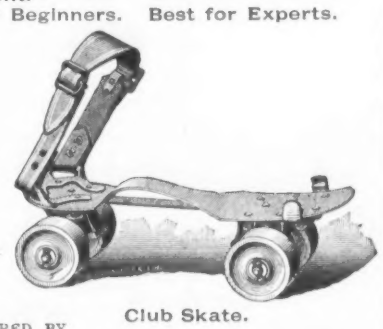

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Ice Cutting Machine.

We are aware that there are imperfect imitations of our machine in the market, and would ask your especial attention to the fact that the practical value of any Ice Machine consists in the **curved or off-set teeth,** through which the ice will readily pass by its own weight. This feature is fully protected by our letters patent, and cannot be used in any other machine.

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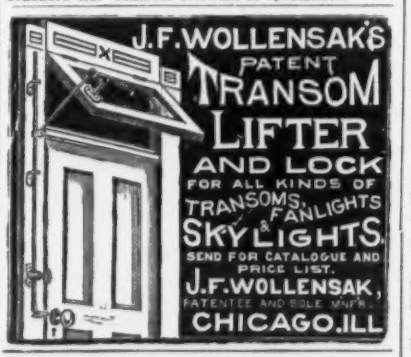
The *Best* and *Cheapest* in the market. Lamp Trimmers, Lemon Squeezers, Ice Picks and Tongs, Nut Crackers &c. Send for price list of specialties.



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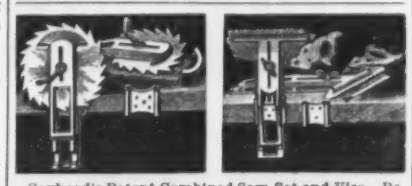

Coxhead's Patent Combined Saw Set and Vise. Received award of Excellence at American Institute, 1884. The only tool in the market for *setting* Circular, Hand and Band Saws and holding them for filing. JOHN F. COXHEAD, Poughkeepsie, N. Y. Send for circular.

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New Process. Air Furnace.

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100 ℔ and over 10¢ ℔.....dis. 20 %

Augers & Bitts.—
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 25 %
Cook's Bitts.....dis 50 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₩ doz., $48; No. 3, ₩ doz., $60 list.....dis 20 %
Bonney's Extension Hollow Augers.....₩ doz $36.00
Pierce's Bitts.....dis 50 %
Griswold Bitts.....dis 60&10 %
Axes.—Blue Jackets.....₩ doz $7.50
Dowse Handled Boys'.....dis 35 %
Ax Handles.—
Oak Extra, 31 in., No. A.....₩ doz $2.50
Oak Extra, 34 in., No. A.....₩ doz 2.50
Oak Extra, 31 in., No. B.....₩ doz 2.00
Oak Extra, 34 in., No. B.....₩ doz 2.00
Oak Extra, 31 or 34 in., No. C.....₩ doz 1.40
Axle Clips.....dis 50 %
Balances.—Chatillon's.....dis 40 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₩ ft., 2¢
Cast Half Round.....₩ ft., ⅝, 2½¢; ⅞, 3¢
Wrought Round.....₩ ft., ⅝, 3¢; ⅞, 4¢; ¾, 5¢
Bells.—Connel's Crank Gong, reduced list..dis 20&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D. reduced list, 1879.....dis 33⅓ %
Blind Fasts.
No. 6 Fasts.....₩ C sets 6.00
Veazie Fasts.....₩ C sets 6.00
Shedd's.....₩ C sets 6.50
Blind Hinges.—Mall. Hook, 3 holes..₩ C sets 7.00
Blocks.—Tackle.....dis 20 %
Brad Awl Handles.—
Phoenix Adjustable.....₩ doz $2.00
Bolts.—Norway Iron Carriage.....dis 75 %
Common Carriage, new list.....dis 75&10 %
Eagle Carriage.....dis 75 %
Borax.—Refined.....₩ ℔ 12¢
Boring Machines.—
Eagle Upright, each.....$5.50 list } dis 50 %
Eagle Angle, each.....6.75 list }
Braces.—Barber's.....dis 40&5 %
Spofford's.....dis 50&5 %
Backus's.....dis 50&5 %
Bracket Saws.—Holly Scroll Saw.....each $2.25
Bracket Saws, extra quality, to No.5.....₩ grs. 0.75
Steel Frame, with patterns.....₩ doz 6.70
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %
Bracket Saw Blades.—Griffith's pat., ₩ gross 75¢
Brackets.—
P. S. & W. Flower Pot, reduced list.....dis 40&10 %
Bronzed Shelf M. B. & D., new list.....dis 50&10 %
Store Shelf.....dis 40&10 %
Butts.—Union Fast Joint.....dis 60&10 %
Union Loose Joints.....dis 70&10 %
Union Japanned Acorn.....dis 70&10 %
Union Silvered Acorn.....dis 70&10 %
Union Boston Finish.....dis 70&10 %
Union Spiral Spring.....dis 25&10 %
Wrought Brass.....dis 70 %
Carriage Bolts.—Eagle Norway.....dis 75 %
Common, new list.....dis 7o&10 %
Carriage Jacks.—Climax No. 1.....₩ doz $20.00
Climax No. 1½.....₩ doz 15.00
Climax No. 2.....₩ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 6.00
Universal No. 4.....each 6.00
Universal No. 5.....each 6.50
Cartridges.—U. S. Cartridge Co.....dis 60&10 %
Cards
Watson's make Horse & Curry....dis 10 % } Rev. List.
Watson's Cotton.....dis 10 % } Aug., 1883.
Watson's Wool.....dis 10 % }
Casters.—Bed and Table.....dis 50&10 %
Chain.
Coil 3-16.....₩ ℔ 9¢
Coil ¼.....₩ ℔ 7¢
Coil 5-16.....₩ ℔ 6¢
Coil ⅜.....₩ ℔ 5¢
Coil 7-16.....₩ ℔ 5¢
Coil ½.....₩ ℔ 5¢
Chalk.—White, Carpenter's.....₩ gross 60¢
Red, Carpenter's.....₩ gross 80¢
Blue, Carpenter's.....₩ gross $1.00
Crayons.....12¢
Chisels.—Peck, Stow & Wilcox.....dis 70&10 %
Underhill, Framing.....dis 35 %
Buck's Chisels.....dis 30 %
Coal Hods.—"Dover."—Galv'd, New List...dis 60 %
Japanned, New List.....dis 60 %
Cocks.—Brass, L. F. & Co.....dis 50&10 %
Coffee Mills.—New List.....dis 40 %
Copper Rivets.—.....dis 50 %
Cordage.—Manila, usual trade dis 1¢.....₩ ℔ 14½¢
Jute.....₩ ℔ 7¢
Cow Ties......dis 50 %
No. 30 3 ft. No. 6 Wire, with toggle.....₩ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap.....₩ doz 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle.....₩ doz 4.30
No. 45, 3½ ft. No. 6 Wire, with snap.....₩ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₩ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap.....₩ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₩ doz 5.60
No. 65, 4½ ft. No. 3 Wire, with snap.....₩ doz 5.80
Crow Bars.—Cas &Steel.....₩ ℔ 6¢
Cutlery.—Pocket American Shear Co.'s.....dis 40 %
Butcher Knives, Wood's, Lap Bolster, Square Handle.....dis 40
Steak Knives.....dis 40 %
Lap Bolster, Oval Handle.....dis 40 %
Sticking.....dis 40 %
Skinning.....dis 40 %
Butcher, Common Round Handle, Wood's....dis 40 %
Shoe Knives, Wood's.....dis 30 %
Dividers.—Cook's.....dis 25 %
Dog Collars......dis 20 %
Door Springs.—Ideal Rod.....₩ doz $1.62
Imitation Torrey's Rod.....₩ doz 1.45
Gem Coil, new list.....dis 50&10 %
Crown.....₩ doz $1.2
Warner's.....₩ doz 1.75
Door Stops.—Thurston's.....dis 50 %
Drawer Knobs.—Thurston's.....dis 50 %
Drills.—Morse Bitt Stock.....} dis 40 %
Morse Straight Shank.....}
Emery.—Wellington Mills.....₩ ℔ 10¢
Walpole Emery Mills.....₩ ℔ 5¢
Turkish, in 10 ℔ cans.....₩ ℔ 7¢
Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 60 %
Standard Sauce Pans.....dis 30 %
Felloe Plates.—Wrought.....₩ ℔ ¢
Files.—American File Co.....dis 60 %
Nicholson File Co.....dis 60 %
Fluting Machines.—Knox List, $4.00.....dis 25 %
Forks.—W. C. & Co.....dis 60 %
Eastern Tool Co.'s. Manure.....dis 60 %
Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32.....₩ doz $1.00
Pierce's.....₩ doz .88
Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₩ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₩ doz. dis 50 & 10 %
Hammers.—Maydole's.....dis 15 %
Hartford Hammer Co.....dis 20 %
Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50&10 %
Common Rollers.....dis 50&10 %
Victor Hangers.....dis 50 %
Victor Rail.....dis 50 %
Hand Screws......dis 10 %
Hatchets.—C. F. Dowse, new list.....dis 35 %
Underhill.....dis 35 %
Hay Knives.—Lightning.....₩ doz $18.00, net
Hinges.—Strap and T (new list).....dis 65&10 %
Providence Plate.....₩ ℔ 5 ¢
Wrought Screw Hook.....₩ ℔ 5 ¢
Hoes.—Eastern Tool Co.....dis 60&10 %
W. C. & Co.'s.....dis 60 %
Hooks and Staples.—Brewers (new list)...dis 70 %
Horse Nails...... No. 6 7 8 9
Putnam Pointed..... .24 .22 .21 .20.....5&7 %
Bridgewater..... .23 .21 20 19.....30 %
Ice Cream Freezers. Packer's, new list.dis 50&10%
Knobs.—"Norwalk." New list.....dis 66⅔ %
Silver Glass.....dis 50&10
Silver Glass Bell Pulls.....dis 50&10¢
Lanterns.—Tubulars, No. 0.....₩ doz $7.50
Lawn Mowers.
Continental.....dis 40&10 %
Quaker City.....dis 40&10 %
National.....dis 50 %
Lead.—Sheet.....₩ ℔ 7 ¢
Pipe.....₩ ℔ 6¼ ¢
Locks.—Norwalk.....dis 66⅔ %
Eagle Cabinet.....dis 40 %
Eagle Trunk.....dis 15 %
Mallory, Wheeler & Co.....dis 66⅔ %
Manure Forks.—W. C. & Co.....dis 60 %
Eastern Tool Co.'s.....dis 60 %
Mattocks.
K. P. & Co., Long Cutter, $16.00 ₩ doz....dis 50 & 10 %
K. P. & Co., Short Cutter, $15.50 ₩ doz. .dis 50 & 10 %
K. P. & Co., Pick Cutter, $16.00 ₩ doz....dis 50 & 10 %
Measuring Tapes.—Eddy's.....dis 20 %
Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's (new list).....dis 40&10 %
American.....dis 33⅓ %
Money Drawers.—Tucker's Alarm....₩ doz $22.50
Mouse Traps.—Delusion.....₩ doz 1.25
Novelty.....₩ doz
Nails......₩ keg
Oilers.—Zinc and Tin.....dis 60 %
Brass and Copper.....dis 50 %
Ox Bows.—Extra finished and varnished....dis 15 %
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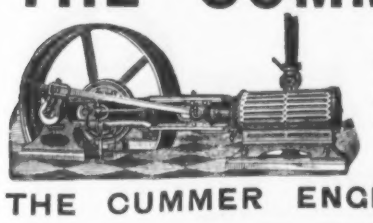

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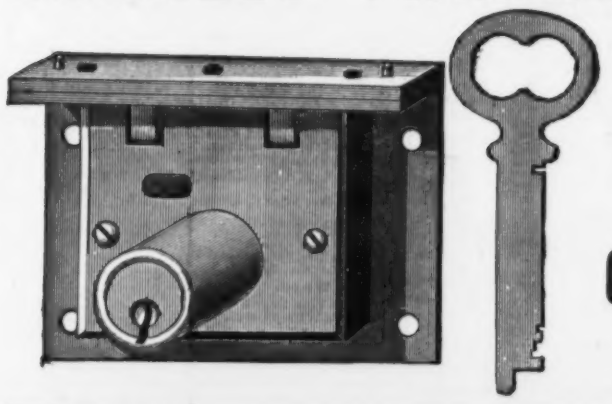

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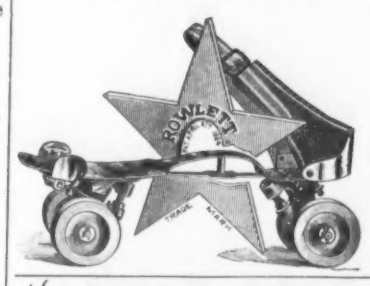

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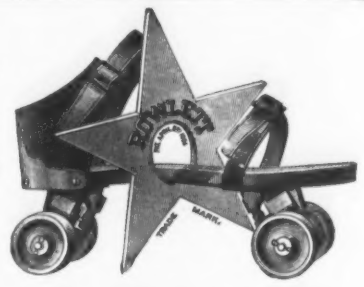

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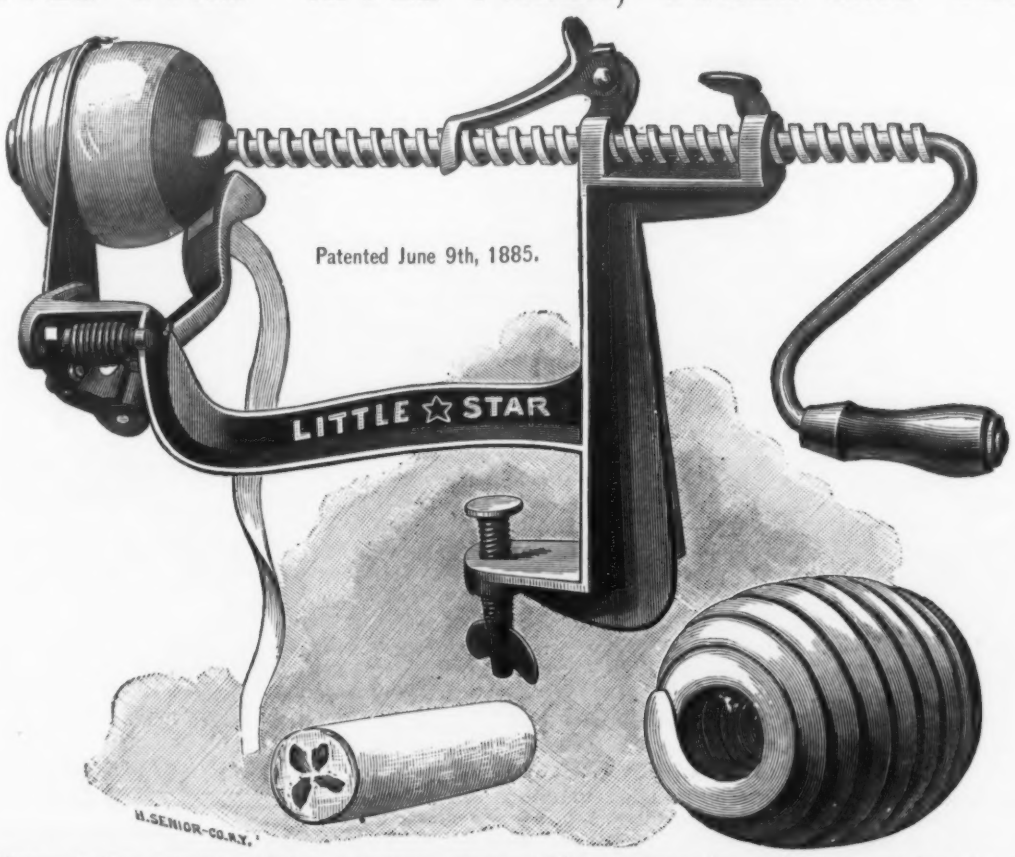

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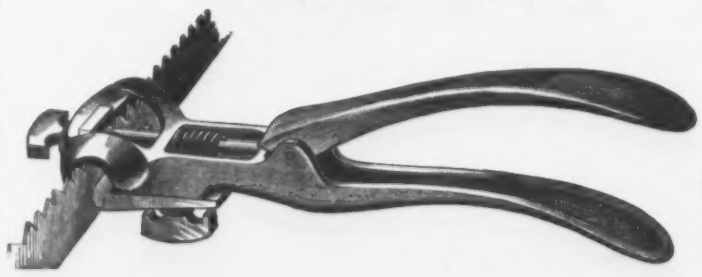

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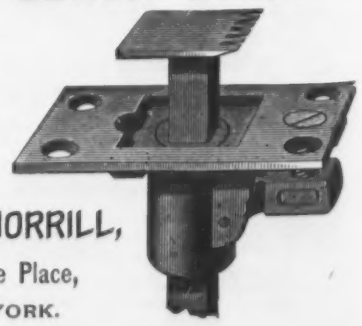

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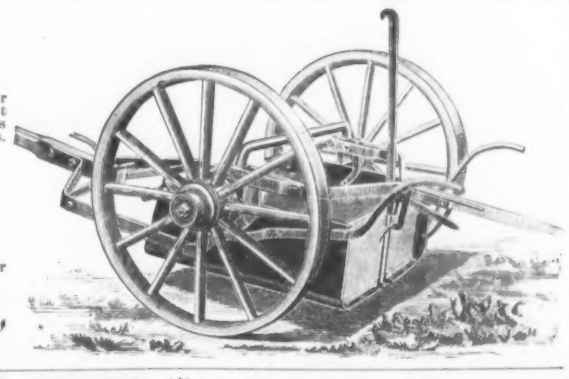

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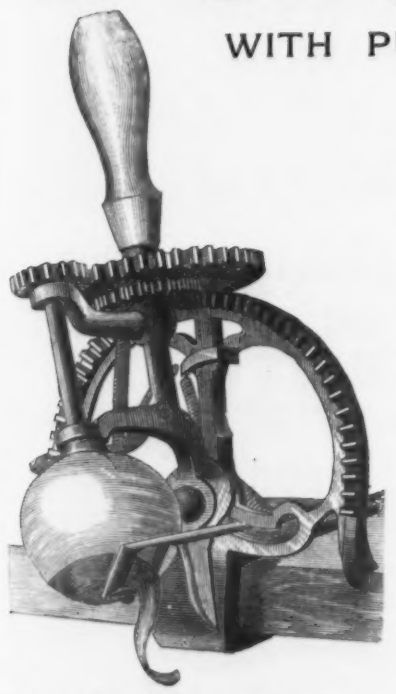

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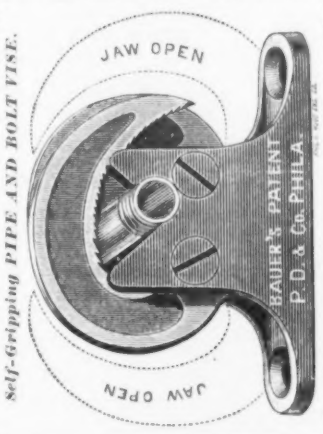

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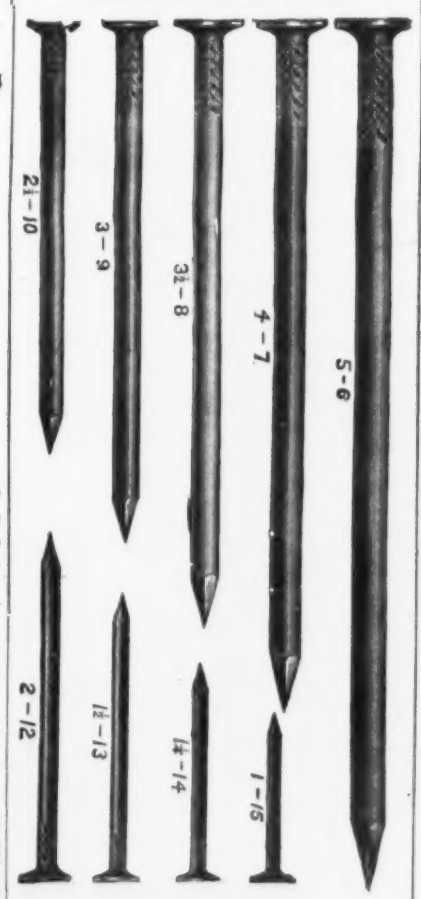

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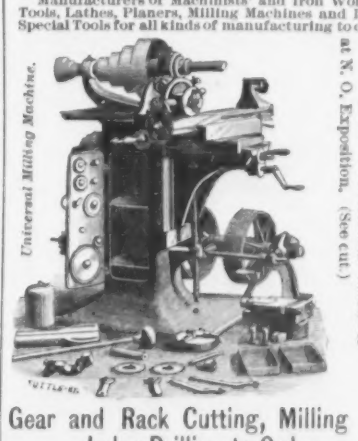

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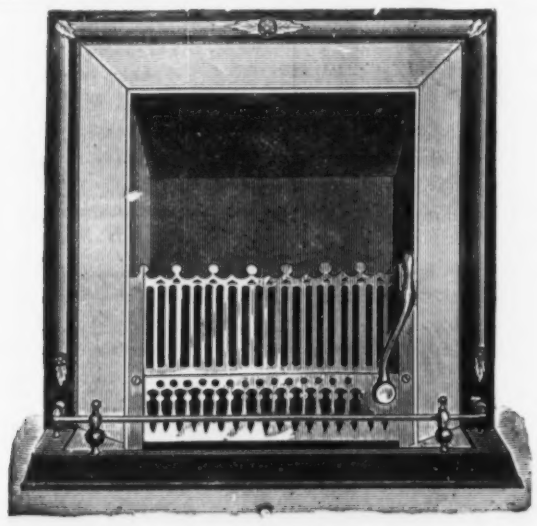

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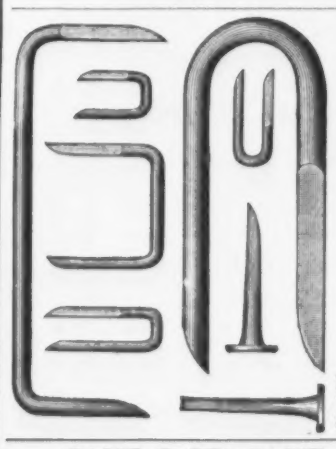
3-4 in. to 6 in. wide, from $\frac{10}{1000}$ to $\frac{200}{1000}$ in thickness, very exact to gauge, and of superior finish. Also Hot-Rolled Strips down No. 16 W. G. Prices to suit the times furnished on application. Tyng & Co., Formerly Agents.



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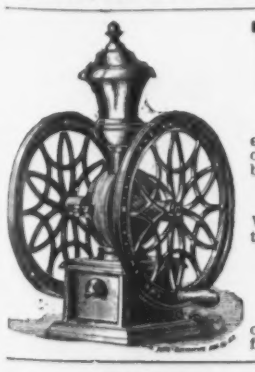
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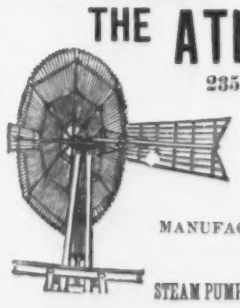
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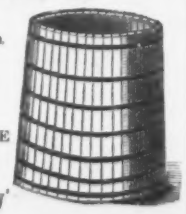
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THE IRONMONGER,
HALF YEARLY SPECIAL ISSUE,
ON SEPTEMBER 19, 1885.

The recipients of this number of "THE IRONMONGER" will be Ironmongers, Hardware Dealers, Implement Agents, Exporters, Importers, Manufacturers and Venders of all kinds of Machinery, Domestic Contrivances, Electroplate, and, in short, all the many classes of persons whom British Manufacturers in the Iron, Steel, Hardware and Metal Trades should reach. The circulation of this number of "THE IRONMONGER" will not be less than
12,000 COPIES.
"THE IRONMONGER" circulates in every country where British Goods are likely to find customers—British Colonies, Australia, New Zealand, The Cape, Natal, India, Canada, Continent of Europe, Asia Minor, Egypt, China, Japan, The United States, South America, &c., &c. Special attention will be paid to the above-named countries, the leading traders in which will receive copies; and from our past experience we can confidently predict that they will not fail to make use of them. It is abundantly apparent that the occasion will be a most advantageous one, and all Hardware Manufacturers should
ADVERTISE IN THIS SPECIAL ISSUE,
to ensure the full benefit of a Home and Foreign representation. For Tariff of Advertisements and Circulars, address the Publisher.
OFFICE, 42 CANNON STREET, LONDON, E. C., ENGLAND.

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THE IRONMONGER DIARY,
1886. SEVENTEENTH YEAR OF PUBLICATION.
The above important Work is now in course of preparation. All who are anxious to do business with Ironmongers, Agricultural Implement Agents, Engineers, Merchants, Shippers, &c., should make good use of this most valuable ADVERTISING MEDIUM.
A COPY OF THIS DIARY WILL BE
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will be handsomely got up, bound in Cloth, Gilt, and will contain, besides the Diary Pages proper (which are interleaved with Blotting Paper), much valuable information of special interest to Members of the Trades represented by THE IRONMONGER.
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Flies and mosquitoes are effectually excluded.

The following **advantages** over all other kinds of Screens will be apparent:

The whole window is covered.

Either Sash may be opened or both at the same time, thus securing better ventilation.

More easily handled, working as easily as an ordinary Shade.

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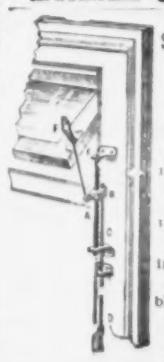

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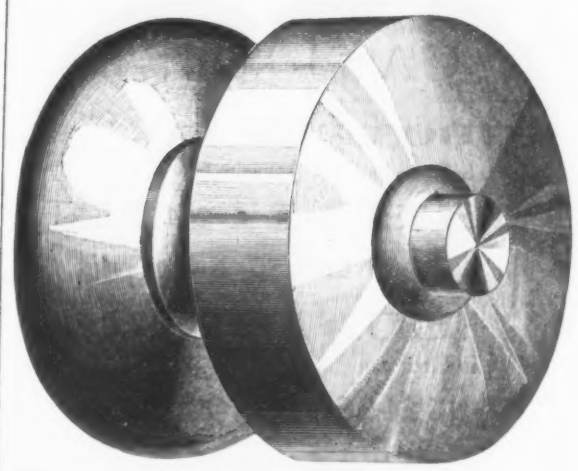

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MANUFACTURED BY
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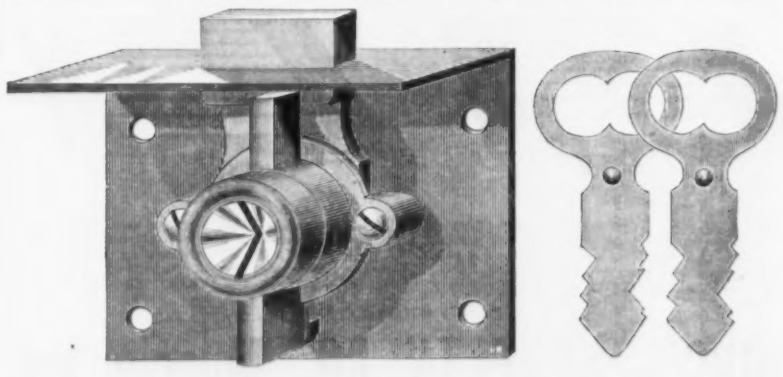

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SOLD BY
MALTBY, CURTISS & CO.,
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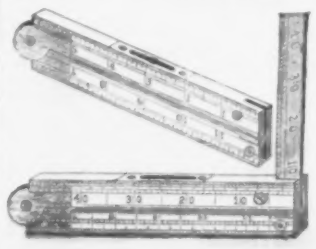

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MANUFACTURERS OF
U. S. Standard Boxwood and Ivory Rules
Also, Exclusive Manufacturers of
L. C. STEPHENS' PATENT COMBINATION RULE.
Send for Price List. Established in 1854.

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Peter Wright's, ℔ ..... 9½ @ 10¢
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Penn Apple Parers ..... 5.50 net
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Lots of 10 to 25 dozen, special prices.

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Hunt's Kentucky and Yankee, ℔ doz. net $6.50@7.00
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Double Bit Axes net $12.00

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Snell's Augers and Bits ..... dis 60@60&5 %
New Haven Copper Company ..... dis. 70 %
Benjamin Pierce Auger Bits ..... dis. 40 %
Jennings' Auger Bits, new list Jan. 1, 1884 dis.. 25 %
Cook's Auger Bits and Augers ..... dis 55 %
Snell's Ship Augers ..... dis 20 %
Watrous' Ship Augers ..... dis. 15 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz dis 33⅓@40 %
Stearns Pat. Hol. Augers, list $48 ℔ doz. . . dis. 20&10 %

Balances.
Light and Common ..... dis. 40&10 %

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Bevin Bros. Mfg. Co. Light Hand Bells . . . . dis. 80 %
Light Hand Bells ..... 80 %
Swiss Pattern Hand Bells ..... 60 %
Connell's Door Bells ..... dis. 20&10 %
Gt. Western & Kentucky Cow, new list . . . . . dis. 70 %

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Upright, without Augers . . . . List, $5.50 } dis. . . 50&5 %
Angular, without Augers . . . . List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 ..... dis 80&5&80&7½ %
Philadelphia Carriage Bolts new list dis 75&10&80 %
Stanley, Wrought Shutter ..... dis. 50, 10, 10&5 %

Braces.—Barber's Improved ..... dis. 40@40&5 %
Barber's Old Style ..... 50 %
Backus, Polished ..... dis. 50&10&10 %
Backus, Nickeled ..... dis. 50&10 %
Spofford ..... dis. 50&5 %
American Ball ..... dis. 55&10 %
Amidon improved ..... dis. 60@60&10&5 %
Amidon Corner Brace ..... dis. 40 %

Butts.—Cast Fast Joint, Narrow ..... dis.60&10 %
Cast Fast Joint, Broad ..... dis.60&10 %
Cast Loose Joint, Narrow ..... dis. 70&10 %
Cast Loose Joint, Broad ..... dis. 70&10 %
Cast Acorn, Loose Pin ..... dis. 70&10 %
Cast Acorn, Japanned ..... dis. 70&10 %
Cast Mayer's Loose Joint ..... dis. 70&10 %
Wrought Loose Pin . . . . dis. 60&10&10@60&10&10&5 %
Wrought Table Hinges and Back Flaps . . dis. 60&10 @ 60&10&10 %
Wrought Loose Joint . . dis. 60&10&10@60&10&10&5 %
Wrought Narrow Fast . . . . . dis. 60&10 @ 60&10&10 %

Blind Butts.
Parker ..... dis. 75&2 %
Clark ..... dis. 80 %
Shepard ..... dis. 80 %
Lull & Porter ..... dis. 80&10 %
Huffer's ..... dis. 50 %

Casters.—Bed (new list July 1, 1880) . . dis. 60@60&10 %
Plate ..... dis 60@60&10 %

Chains.—German Halter and Coil, list June, 1884 ..... dis. 55 @ 55&5 %
Galvanized Pump ..... ℔ ℔ 5¾@6¼¢ net
Best Proof Coil Chain—English.

℔ ℔	9/16	7/8	5/8	5/16	3/4	7/16	1/2
	3-16	¼	5-16	⅜	7-16	½	

Chisels.—Socket Framing . . . . dis 75&10@75&10&5 %
Socket Firmer ..... dis 75&10@75&10&5 %
Butcher's ..... $5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880 ..... dis 40 @ 40&10 %
Enterprise ..... dis 20&10 %

Cutlery.—Walden Pocket ..... new list net
Pennsylvania Knife Co. ..... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Door Hangers.—Cronk Barn Door Hangers . . . No. 4, $12.00; No. 5, $14.00; No. 6, $18..00 . . dis. 50&5&50&10 %

Drawing Knives.
Hart Mfg. Co.'s ..... dis. 75&10@75&10&5 %
Adjustable Handle ..... dis 20@20&5 %

Fry Pans.
Tinned ..... dis 45 %

℔ doz.	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No.	0	1	2	3	4	5	6	7	8

Burnished ..... dis. 70@70&5 %

℔ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson ..... dis 60 %
Disston ..... dis 60 %
Butcher ..... 60&5@60&10 %
Crown and Arrow ..... 60&5@60&10 %

Fluting Machines.
Eagle—3¼ in. roll . . . . each, $2.15 } dis 35 %
Eagle—5½ in. roll . . . . each, 2.85 }
Crown—4½ in. roll . . . . each, 3.50 }
Crown—6 in. roll . . . . each, 4.00 } dis 35 %
Crown—8 in. roll . . . . each, 6.50 }
Geneva Fluter ..... dis 25 %
Favorite com. Fluter and Sad Iron . . ℔ doz., $10.50 net

Hammers.
Yerkes & Plumb's, new list ..... dis 40&10 %
Maydole Hammers ..... dis 15&10 %
Howell A. E. Nail Hammers ..... ℔ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut ..... 33¢ pair net
Boynton Loop Handles Cross-Cut ..... 33¢ pair net

Hatchets.
Yerkes & Plumb, new list ..... dis 40&10&5 %
Hunt ..... dis 40 %

Hay and Straw Knives.
Lightning ..... ℔ doz., $18.00 dis. 10@10&5 %
Electric ..... ℔ doz., 18.00 dis. 30 %
Wadsworth ..... ℔ doz., net 35&5 %
Walton Straw Knives ..... ℔ doz., net 17.00

Hinges.
Strap and T ..... dis 65&10 %

Horse Nails. Nos. 5 6 7 8 9 10
Globe ..... 26 23 21 20 19 18 dis 10&5&5 %
Ausable ..... 30 27 25 24 23 22 dis 25&10 %
Pol'ed and P't'd ..... 31 28 26 25 24 23 dis 25&10 %
Clinton ..... 23 21 20 19 18 dis 25&10 %
" Pol'ed & P't'd. ..... 24 22 21 20 19 dis 25&10 %
Saranac ..... 26 23 21 20 19 18 . . dis 20 %

Locks and Knobs.
Branford Locks ..... 66⅔&2 %
Gaylord Cabinet ..... dis 40&2 %
Parker's Cabinet ..... dis 40&2 %
American Padlocks ..... dis 66⅔&2 %
Scandinavian Padlocks ..... dis 50 %

℔ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.	57	58	59	60	61	62	63	
℔ doz.	$18.00			26.00		32.00		} dis 60 %
No.	64			65		66		

Lanterns.
Buckeye ..... large list, net; small list, net
Tubular ..... No. 0, $7.50; No. 1, $9.00 ℔ doz. net
Guards 40¢ extra.

Lawn Mowers.—Pennsylvania . . . . . } 40&5 % 3 %
Philadelphia . . . . . } cash 30
Excelsior . . . . . } days.
Continental . . . . . }
Quaker City . . . . . }

Lawn and Garden Pumps.
Holland Patent ..... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter ..... new list, 60&10 %
Pennsylvania Pattern ..... dis 60& 10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets . . dis. 20&10 %
Stebbins' Gates ..... dis. 80 %
Lincoln's Gates ..... dis. 70&10 %
Landers, Frary & Clark's Petroleum ..... dis 40&5 %
Brass Liquor Cocks new list Jan. 1, 1880 . . dis. 65&5 %
Cork Lined Cocks ..... dis. 70 %

Meat Cutters.
Dixon's ..... dis. 40 %
Woodruff ..... dis. 40 %
Stowe ..... dis. 40 %
Hale's ..... new list, dis. 60, 10&2 cash
American ..... dis 35 %
Stuffers ..... dis. 40 %
Enterprise Stuffers ..... dis. 20&10%

Planes.—Sandusky Tool Co. ..... dis. 20&2 %
Ogontz ..... dis. 25&2 %
Ohio and Auburn ..... dis. 20&2 %
Bailey (S. R. & L. Co.) ..... dis. 20&10 %

Plane Irons.—Ohio Tool Co. ..... dis. 20&10 %
Butcher's ..... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ..... dis. 70&10 %
Stanley's Non-Adjustable ..... dis. 70&10 %

Picks.—New list ..... 60&5&60&10 %

Razor Strops.
Lamont Combination ..... ℔ doz. $4.00
Lamont Combination ..... 1 gross lots $42.00
Imitation Emerson ..... ℔ doz. $2.00
Lamoille, 1 doz. lots ..... $3.50 net
" 1 gro. " ..... $38.00 net

Rules.—Stanley Boxwood ..... dis. 80&10 %
Stanley Ivory ..... dis. 55 &55&10%

Steelyards.—Hart's Pattern dis ..... 40&10&50 %

Per doz.	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs	50	100	150	200	250	300

American Pattern ..... dis. 40&10&50 %

Per doz.	$8.00	10.25	13.75	15.60	16.75	19.50
Lbs	50	100	150	200	250	300

Scale Beams ..... 60&60&5 %
Custers ..... 25 %

Squares.
Steel and Iron . . dis. 60& 10 % ; full cases dis. 60&10&5 %
Try Squares, Stanley ..... dis 60&10 %
Disston's Try Squares ..... dis 45&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..... ℔ doz $9.00 }
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ..... ℔ doz $8.50 } 40
Clipper No. 5, Painted Red, Boxed and Sharpened ..... ℔ doz $8.00 }

Saws.—Disston's Hand, Panel and Rip . . . . dis 20&10 %
Disston's Circular ..... dis 45&10 %
Cross-Cut No. 2, Plain Tooth . . . . . dis 45&10 %
Cross-Cut Patent Tooth . . . . . dis 45&10 %
Cross-Cut Champion Tooth . . . . . dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list ..... dis 20 %
Griffiths ..... dis 50&10&6 %
Rowland ..... dis 60&5&60&10 %

Sad Irons.—4 to 10 ℔ ..... ℔ ℔ 2¼@2¾¢
Mrs. Potts' Patent ..... dis 40 %

Stone.
Washita Extra ..... ℔ ℔ 16¢
Washita No. 1 ..... ℔ ℔ 13½¢
Washita No. 2 ..... ℔ ℔ 10¢
Washita Slips ..... ℔ ℔ 12½¢
Washita Axe ..... ℔ ℔ 13¢ net
Hindostan Oil Stone No. 1 ..... ℔ ℔ 6¢. dis. 40 %
Hindostan Axe Stone ..... ℔ ℔ 8¢. dis. 40 %
Hindostan Slips ..... ℔ ℔ 10¢. dis. 40 %

Screws.—Parker List.
Flat Head Iron ..... dis 85 %
Flat Head Brass ..... dis 85 %
Round Head Brass ..... dis 83⅓ %
Round Head Iron ..... dis 85%

Spoons.
Plated ..... dis 50&5&5 %
German Silver ..... dis 40&10@50 %
Britannia, Boardman's ..... dis 60 %
Britannia, Parker's ..... dis 60&10 %
Tinned ..... dis 10 %

Springs.—Torrey ..... dis 50 %
Gem No. 3 small Japanned ..... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned ..... 2.75 }
Coil No. 10 ℔ gross net ..... $5.50@6.00
Other Standard Springs ..... dis 50&10@60 %
Warner Door Springs, ℔ doz. $2.50 ..... dis 40&10 %
Standard Spring Hinges—
Single No. 0, ℔ doz. net ..... $1.10@1.25
Single No. 1, ℔ doz. net ..... 1.25@1.50
Other Standard Spring Hinges ..... dis 25&10@40 %

Stocks and Dies. ..... dis 10 and 5 %

Stove Polish.—Gem ..... ℔ gross, $4.50, dis 5 %
Dixon ..... 6.00, dis 10 %
Fire Fly ..... $3.00 gross. net

Tacks. ..... Combination discounts
Shoe Nails—4-8, and over, 5½¢ ..... } 10 %
Shoe Nails—3½-8, and under 7¢ ..... }
Double Pointed Tacks . . . . . dis 75&10&5 %

Traps.
Genuine Oneida—Newhouse ..... dis 35 %
Im. Oneida—Newhouse list. First qual. dis 60&10&10 %

Vises.—Solid Box. Trenton new list . . dis 50&10@60 %

Wrenches.—Agricultural ..... dis 75&10&5 %
Coes' Genuine ..... dis 60&3 %
Coes' Mechanics' ..... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar . . . . . dis 80 @ 80&5 %

Wire.
Bright or Annealed, No. 0 to 18 . . . . . dis 70@70&5 %
Bright or Annealed, No. 19 to 26 . . . . . dis 70@70&5 %
Bright or Annealed, No. 27 to 36 . . . . . dis 75@75&5 %
Coppered, 0 to 18 ..... dis 65&5 %
Tinned Broom Wire ..... dis 65 %
Galvanized Barb Wire ..... 5½¢
Painted Barb Wire ..... 4½¢
Galvanized, No. 7 to 18 . . . Market List, dis . . . . . 60 %

Wringers.

Peerless No. 2½	$30.00	dozen lots $3.00 per dozen.
Peerless No. 2	33.00	
Universal No. 2½	30.00	
Universal No. 2	33.00	
Novelty No. 2, for common tubs	30.00	
Novelty No. 3, " "	34.50	
Excelsior E, for stationary tubs	39.00	
Excelsior F " "	43.50	

PITTSBURGH.

Merchant Iron.

Terms.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℔ cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1½ to 4 by ⅛ to 1 inch ..... 2.0¢
4½ to 6 by ⅛ to 1 " ..... 2.1¢
1⅝ to 6 by 1¼ to 1½ " ..... 2.4¢
1¼ and 1⅝ by ⅛ to ¼ " ..... 2.6¢
1 and 1¼ by ⅛ to ¼ " ..... 2.2¢
⅝, ¾ and ⅞ by ⅛ to ⅛ inch ..... 2.4¢

Rounds and Squares.

1 to 1⅞ ..... 2.0¢ | ⅝ to 9-16 ..... 2.2¢
2 to 2⅝ ..... 2.2¢ | ⅝ to 7-16 ..... 2.4¢
2⅝ to 3¼ ..... 2.5¢ | ½ ..... 2.6¢
3⅜ to 4 ..... 3.0¢ | 5-16 ..... 2.8¢
4¼ to 5 ..... 3.5¢ | ¼ ..... 3.0¢
¾ to ⅞ ..... 2.1¢ | 3-16 ..... 5.0¢

Oval Iron.

⅞ to 1¼ ..... 2.4¢ | ⅛ ..... 2.8¢
⅝ to ¾ ..... 2.6¢ | ⅜ ..... 3.2¢

Half Oval and Half Round.

⅞ to 1¼ inch ..... 2.7¢ | ⅛ inch ..... 3.5¢
⅝ to ¾ " ..... 3.2¢ | ½ " ..... 5.0¢

Horse Shoe.

⅝ to 1⅜ by 5-16 to ⅞ inch ..... 3.0¢

Wagon Box Iron.

⅛ inch, Nos. 13 and 14 ..... 3.2¢
⅛ " " 11 and 12 ..... 3.0¢
¾ " " 13 and 14 ..... 2.5¢
¾ " " 11 and 12 ..... 3.3¢
⅞ " " 13 and 14 ..... 3.9¢
⅞ " " 11 and 12 ..... 3.6¢

Heavy Bands.

3½ to 6 by ¼ and 5-16 inch ..... 2.2¢
1½ to 3½ by ¼ and 5-16 " ..... 2.2¢
1 to 1¾ by ⅛ and 5-16 " ..... 2.3¢
¾ to ⅞ by ¼ and 5-16 " ..... 2.5¢
⅝ and ⅞ by ¼ and 5 16 " ..... 3.0¢

Light Bands.

1½ to 6 by 1/16 to 3-16 ..... 2.5¢
1½ to 6 by ⅛ Nos. 11 and 12 ..... 2.6¢
1 to 1¾ by 1/16 to 3-16 ..... 2.6¢
1 to 1¾ by Nos. 11 and 12 ..... 2.7¢
⅞ and 13-16 by 1/16 to 3-16 ..... 2.9¢
⅞ and 13-16 by Nos. 11 and 12 ..... 3.0¢
¾ and 11-16 by 1/16 to 3-16 ..... 3.2¢
¾ and 11-16 by Nos. 11 and 12 ..... 3.3¢
⅝ and 9-16 by 1/16 to 3-16 ..... 3.5¢
⅝ and 9-16 by Nos. 11 and 12 ..... 3.6¢
⅝ inch by 1/16 and 3-16 ..... 3.8¢
⅝ inch by Nos. 11 and 12 ..... 3.9¢

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15 ..... 2.8¢
1¼ to 2, Nos. 16, 17 and 18 ..... 2.9¢
1¼ to 2, No. 19 ..... 3.0¢
1¼ to 2, No. 20 ..... 3.1¢
1¼ to 2, No. 21 ..... 3.2¢
1¼ to 2, No. 22 ..... 3.3¢
15-16, 1, and 1¼, Nos. 13, 14 and 15 ..... 3.0¢
15-16, 1, and 1¼, Nos. 16, 17 and 18 ..... 3.1¢
15-16, 1, and 1¼, Nos. 19 and 20 ..... 3.2¢
15-16, 1, and 1¼, No. 21 ..... 3.3¢
15-16, 1, and 1¼, No. 22 ..... 3.4¢
⅞, Nos. 13, 14 and 15 ..... 3.2¢
⅞, Nos. 16, 17 and 18 ..... 3.3¢
⅞, Nos. 19 and 20 ..... 3.4¢
⅞, No. 21 ..... 3.5¢
⅞, No. 22 ..... 3.6¢
13-16, Nos. 13, 14 and 15 ..... 3.4¢
13-16, Nos. 16, 17 and 18 ..... 3.5¢
13-16, Nos. 19 and 20 ..... 3.6¢
13-16, No. 21 ..... 3.7¢
13-16, No. 22 ..... 3.8¢
¾, Nos. 13, 14 and 15 ..... 3.5¢
¾, Nos. 16, 17 and 18 ..... 3.6¢
¾, Nos. 19 and 20 ..... 3.7¢
¾, No. 21 ..... 3.8¢
¾, No. 22 ..... 3.9¢
11-16, Nos. 13, 14 and 15 ..... 3.7¢
11-16, Nos. 16, 17 and 18 ..... 3.8¢
11-16, Nos. 19 and 20 ..... 3.9¢
11-16, No. 21 ..... 4.0¢
11-16, No. 22 ..... 4.1¢
⅝, Nos. 13, 14 and 15 ..... 3.9¢
⅝, Nos. 16, 17 and 18 ..... 4.0¢
⅝, Nos. 19 and 20 ..... 4.1¢
⅝, No. 21 ..... 4.2¢
⅝, No. 22 ..... 4.3¢
⅝, No. 23 ..... 4.4¢
9-16, Nos. 13, 14 and 15 ..... 4.1¢
9-16, Nos. 16, 17 and 18 ..... 4.2¢
9-16, Nos. 19 and 20 ..... 4.3¢
9-16, No. 21 ..... 4.4¢
9-16, No. 22 ..... 4.5¢
9-16, No. 23 ..... 4.6¢
½ inch, Nos. 13, 14 and 15 ..... 4.3¢
½ inch, Nos. 16, 17 and 18 ..... 4.4¢
½ inch, Nos. 19 and 20 ..... 4.5¢
½ inch, No. 21 ..... 4.7¢
½ inch, No. 22 ..... 4.8¢
½ inch, No. 23 ..... 4 9¢

The prices under Hoop Iron do not apply to Cotton Ties.

1-10¢ ℔ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ℔ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length.

9 to 11 ℔, ℔ set of 6 hoops ..... 3.0¢
8 ℔ and less than 9 ℔, ℔ set of 6 hoops ..... 3.1¢
Less than — ℔ ℔ set of 6 hoops ..... 3.2¢

Extras for Cutting to Length all Preceding Irons.

All Iron, including Tire ..... 1.10¢

Tank Iron.

No. 9 and heavier ..... 2.8¢
Plow Slabs ..... 3.0¢
Plow Wings ..... 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.5¢	5.0¢
Nos. 15 to 17	3.3¢	4.8¢	5.4¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.5¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.

1st quality (A) ..... 10¢ | 2d quality (B) ..... 9¢

Galvanized C. H. B.—(Charcoal Hammered Blooms.)

Nos. 14 to 20 ..... 12¢ | No. 27 ..... 15¢
Nos. 21 to 24 ..... 13¢ | No. 28 ..... 16¢
Nos. 25 and 26 ..... 14¢ | No. 29 ..... 18¢
60 @ 62½ % discount.

Coal Screen Iron.

1¾ by ⅝ by 5-16 ..... 2.5¢ | 1 by ⅝ by 5-16 ..... 3.0¢

Angle Iron.

2¼, 2½, 2¾ and 4 inch ..... 2.8¢
1¼, 1½, 2 and 2¼ " ..... 2.8¢
1¼ inch ..... 2.9¢
1 " ..... 3.1¢
1¼ by 1 inch, for Plow Handles ..... 3.3¢
1½ by ¾ " " ..... 3.3¢
1¾ by ⅝ " " ..... 3.4¢

T Rail.

8 lbs. to the yard ..... 2.4¢ | 20 lbs. to the yard ..... 2.7¢
12 " " ..... 2.3¢ | 28 " " ..... 2.3¢
16 " " ..... 2.3¢ | 30 " " ..... 2.3¢

Splice Joints for 12, 16 and 20-lb. Rail, 30¢ each; 28 and 30-lb. Rail, 40¢ each; 40-lb., 50¢ each.

3¼ by ⅝ and ½ Spikes for 20 and 28-lb. Rail ..... 3½¢
2¼ and 3 by ⅝ " " 12 and 16-lb. " ..... 3.5¢
2½ by 5-16 " " 8-lb. Rail ..... 4.0¢

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ⅛ to ⅝ inch ..... 2.5¢
1¼ by ⅝ and 7-16 inch ..... 2.7¢
1¾ by ⅝, 7-16 and ½ inch ..... 3.0¢

Juniata Nail Rods ..... 6.0¢
Norway Nail Rods ..... 7.5¢
Guard Iron, ¾x⅝x⅜ and ¼x⅝x⅜ ..... 3.5¢
Guard Iron ⅝x⅝x9-16 and ¼x⅝x⅜ ..... 3.7¢
Drag Bars ..... 2.8¢
Dropper Bars ..... 3.3¢
Cylinder and Landside Iron ..... 2.7¢
Plow Beam Iron ..... 2.5¢

Nails.

See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.

⅝ to 2 inches, inclusive ..... 8½¢
1-16 and 2⅛ to 3 inches ..... 9½¢
¼ and 3⅛ to 4 " ..... 10½¢
7-32 and 4⅛ to 5 " ..... 11½¢
3-16 and 5⅛ to 6 " ..... 11¢
5-32 inch ..... 18¢
⅛ " ..... 25¢
Oil Well Steel Forgings ..... 18¢

Machinery Steel.

Ordinary Sizes, ⅜ to 2 inch	Crucible	Bessemer & Open Hearth.
Round	4½¢	3¢
5-16 and 2⅝ to 3 inches	5½¢	4¢
¼ and 3⅛ to 6 "	6½¢	5¢
7-32 inch	7½¢	6¢
3-16 "	9¢	8¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.

Crucible Cast Steel ..... 5¢
Open Hearth Cast Steel ..... 4¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	9½¢	8½¢	6½¢	5¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.

Auger and Auger Bit ..... 3¢
Axle Steel for carriages and wagons ..... 3¢
Frog Points and Plates ..... 5½¢
Frog Side Bars ..... 5¢
Pick, plain (hammered) ..... 5¢
Pick and Mattock, beveled (rolled ..... 3¢
Skate Steel ..... 4½¢
Table Cutlery, plain ..... 3½¢
Table Cutlery, beveled ..... 4¢
Pike and Cant Hook ..... 4¢
Coal and Granite Wedge ..... 7¢
Roller ..... 5½¢
Spindle, subject to Machinery classification ..... 5½¢
Trap Spring Steel ..... 6¢
Forged Crank Pins and Latne Spindles ..... 7½¢
Piston Rods, plain ..... 4¢
Piston Rods, forged to shapes ..... 7½¢
Slide Bars, plain ..... 5¢
Slide Bars, forged to shapes ..... 7½¢

Open Hearth or Bessemer.

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ..... 4¢
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ..... 5¢
Circulars and semi-circulars, when ordered separately ..... 6¢
Smoke Stack, to shape ..... 6¢
Locomotive Tank Steel ..... 4¢

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8 inch and over ..... 5¢
Mill Saw, 8-inch and over ..... 5¢
Taper, 3½ inch and over ..... 6¢
Horse and Shoe Rasp ..... 5¢

Spring Cast Steel.

Spiral, Taper, cut to lengths ..... 4½¢

Tire Cast Steel.

1x¼ and over ..... 6½¢
1x3-16, ⅞x3-16 and ¼ ..... 7¢
1 and 13-16x⅛ and 5-32, ⅞x13-16 and 5-32 ..... 9¢
¾ and ⅝x1⅛ and 3-32 and 12 g ..... 10¢
Solid Safe Cast Steel ..... 4¢
Three and Five Ply Cast Steel ..... 5¢

Agricultural Implement Cast Steel.

Fork and Rake, Crucible ..... 4½¢
Horse Rake Steel, cut to lengths, Crucible ..... 5¢
Hoe, Crucible ..... 5¢
Corn Stalk Cutter, beveled ..... 4½¢
Beveled Hoe and Shovel Steel in Bars ..... 4½¢
Crucible Plow Steel in Slabs ..... 4½¢

Bessemer and Open Hearth.

Spring ..... 2½¢
Spring spiral and taper, cut to lengths ..... 3½¢
Tire, 2-16 thick and above ..... 2½¢
Toe Calk ..... 2½¢
Flow ..... 2½¢
Axle Billets ..... 2½¢
Sleigh Shoe ..... 2 ¢
Cutter Shoe, cut to lengths and tapered ..... 2½¢
Scythe Back Steel ..... 3½¢
Grain Drill Bars ..... 2½¢
Grain Drill Points ..... 3½¢
Rolling Coulter Blanks, cut and punched ..... 6¢
Thrasher Steel ..... 2½¢
Thrasher Teeth ..... 3½¢
Rolled Hammer Billets ..... 2½¢

Terms.—Four months' 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.

Furnace Floor and Straightening Plates ..... 1½¢
Housings and Castings not otherwise specified ..... 2½¢
Guide Plates ..... 2½¢
Spindles and Coupling Boxes ..... 1¾¢
Sand Rolls and Pinions, large size ..... 2 ¢
Sand Rolls and Pinions, small size ..... 2½¢
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54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
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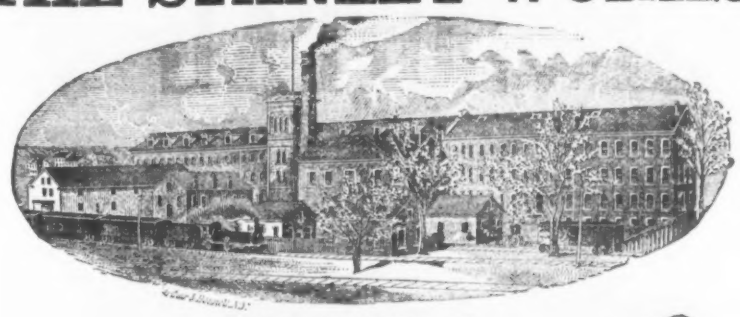

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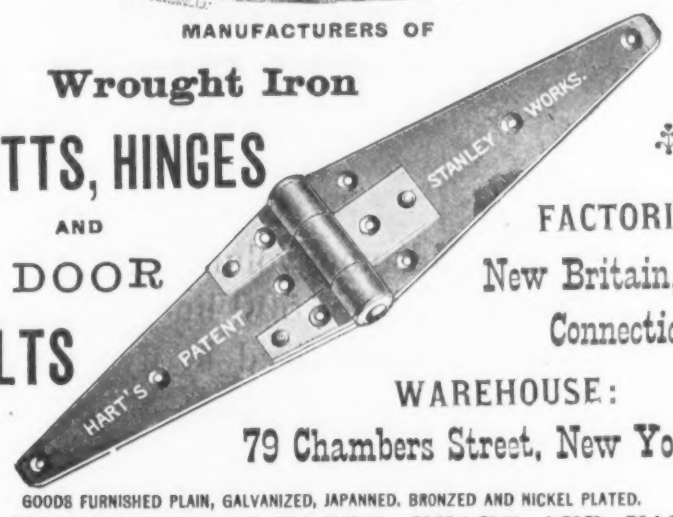

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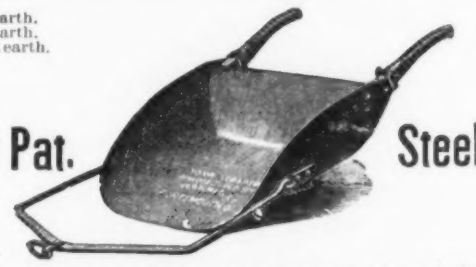

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The specimen page here shown is from the last division of the book, entitled "Pattern Problems," and which embraces more than one-half of the entire work. It shows the manner in which practical questions are treated. The list of problems demonstrated is very extensive, and embraces almost everything of common occurrence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything, from a simple miter to the most complex problems, so arranged as to meet his requirements without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will faciliate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply.

Pattern Problems. 161

G H K, of Fig. 426, is presented one of the sets of conditions which necessitate a change of profile, in either the horizontal or raking molding, in order to accomplish a miter joint at the point indicated by I H in the plan. In other words, the conditions are such that with a given profile, as shown by A' in the raking molding, the horizontal molding forming the return will require to be modified, as shown by the profile A², in order to form a miter upon the line I H in the plan; or, if A² is established, A' will have to be constructed to correspond with A². The reason for this is quite obvious. The distance across the raking molding at right angles to its lines is greater than the corresponding distance across the return molding at right angles to its lines; therefore the projection in the cornice, as shown by the profile A², must be distributed through a smaller space than is shown in the profile A'. In this problem we assume that the pitch of the raking cornice B C is established and that the profile A is given, and from these parts it is required to develop the modified profile. We have the choice of placing the normal profile in the horizontal return and making the raking profile correspond with it, or of placing the normal profile in the raking molding and making the profile of the horizontal molding agree with it. Although the principle upon which these operations is performed is identical in both, the demonstration will be made clearer if each is fully illustrated independent of the other. In this problem and the following one, therefore, we show the several steps necessary to take in modifying the profile, and in cutting the several patterns required to form the structure indicated by the elevation and plan. First we will assume that the normal profile occurs in the raking cornice, and that the horizontal profile is to be modified to suit it. We then proceed as follows: Draw a representation of the normal profile in the raking cornice, as shown by A', placing it to correspond to the lines of the cornice, as shown. Draw another profile corresponding to it in all parts, directly above or below the foot of the raking cornice, in line with the face of the new profile to be constructed, placing this profile A so that it shall correspond with the lines of the horizontal cornice. Divide the profiles A and A' into the same number of parts, and through the points thus obtained draw lines, those from A' being parallel to the lines of the raking cornice, and those from A intersecting them vertically. Through these points of intersection trace a line, which gives the modified profile, as shown by A². Then A² is the profile of the horizontal return, indicated by G H I F in the plan. It is also the elevation of the miter line I H of the plan for the several patterns involved. We therefore proceed as follows: At any convenient point at right angles to the lines of the raking cornice lay off the stretchout M N of the profile A', through the points in which draw measuring lines in the usual manner. Place the T-square at right angles to the lines of the raking cornice, and,

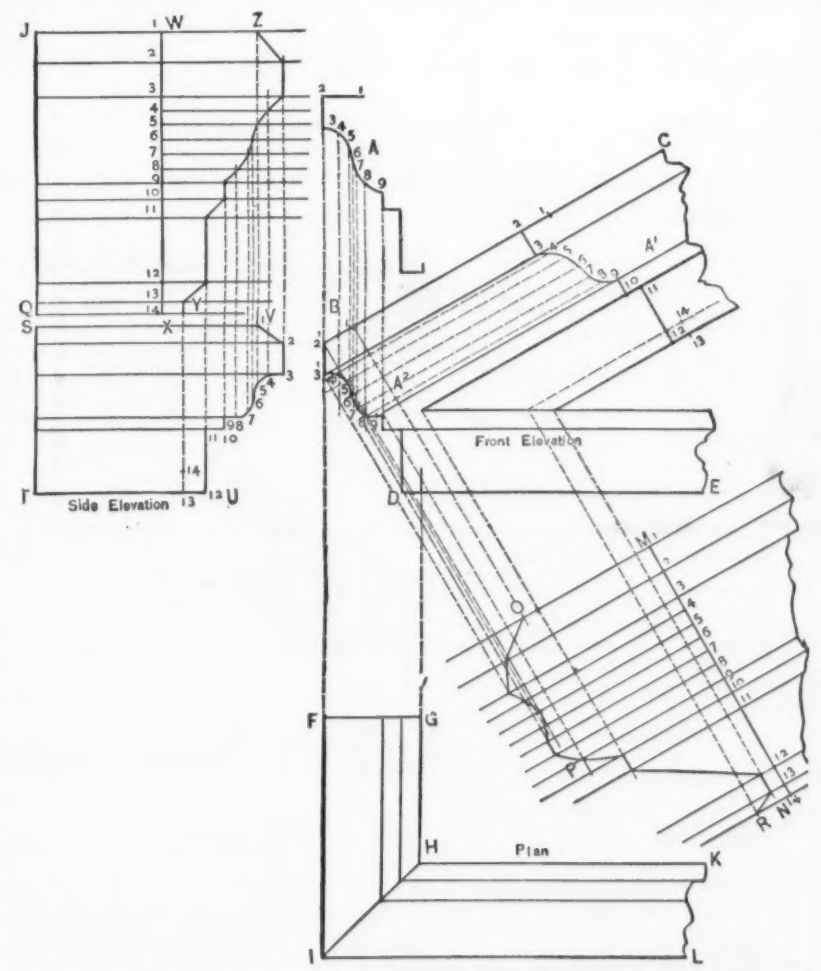

Fig. 426.—To Ascertain the Profile of a Horizontal Molding Adapted to Miter with a Given Inclined Molding at Right Angles in Plan, and the Several Miter Patterns Involved.

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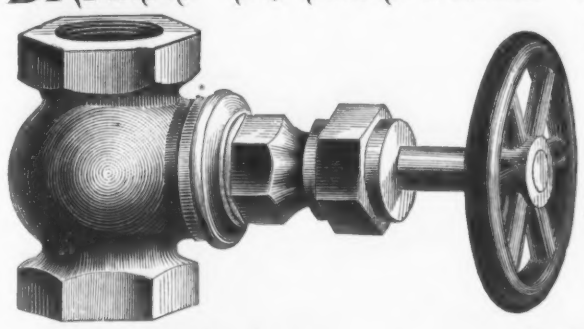

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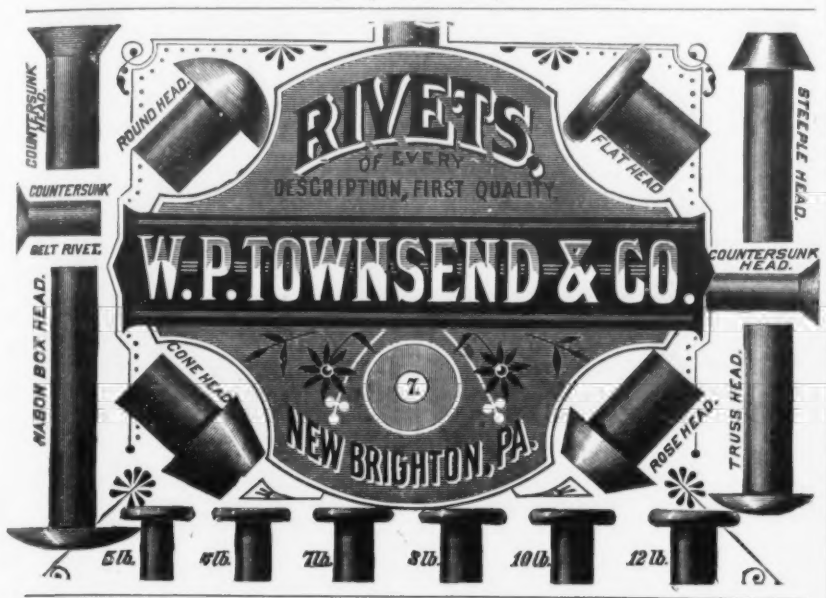

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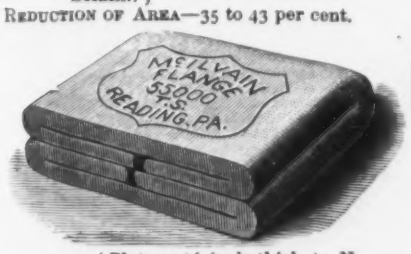

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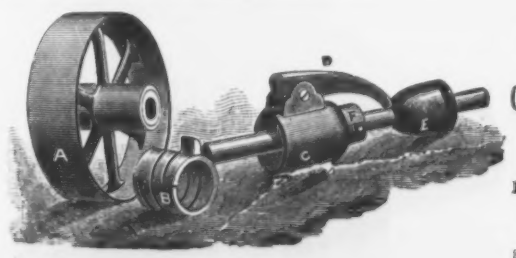

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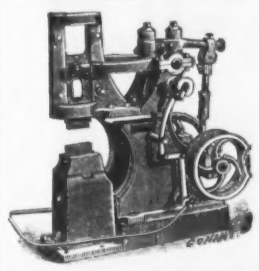

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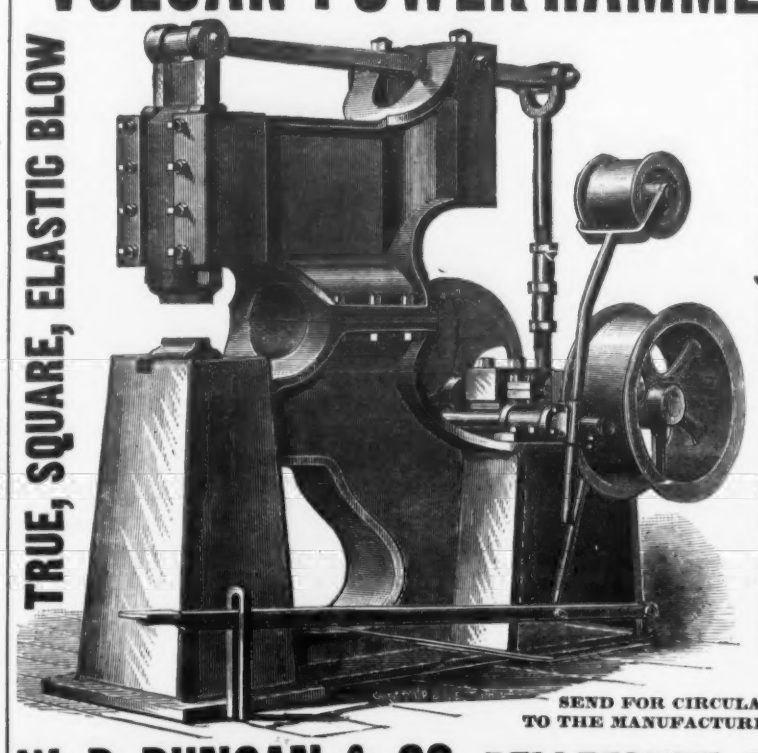

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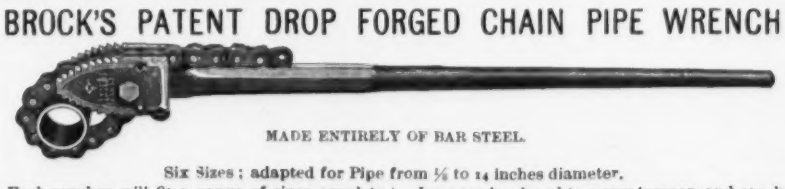

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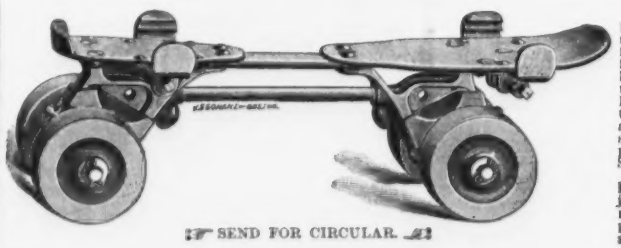

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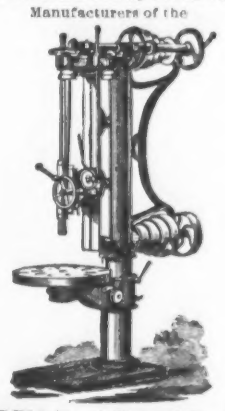

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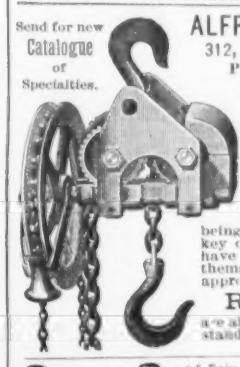

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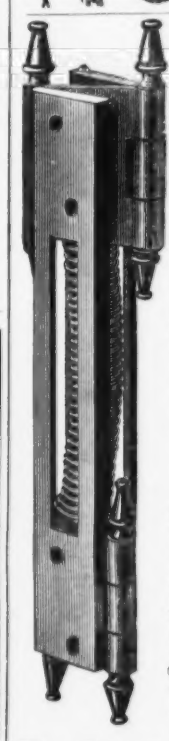

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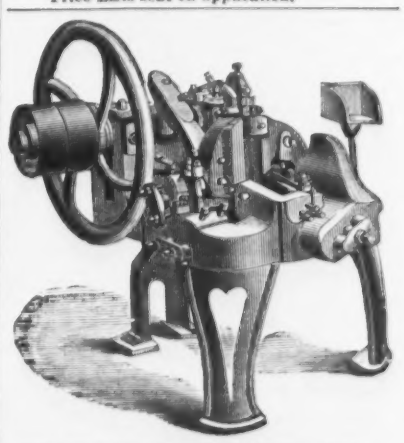

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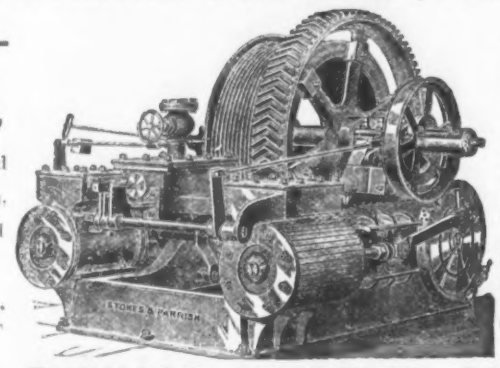

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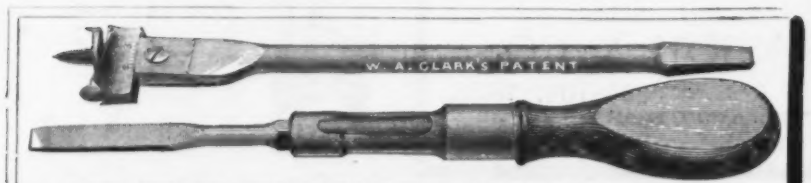

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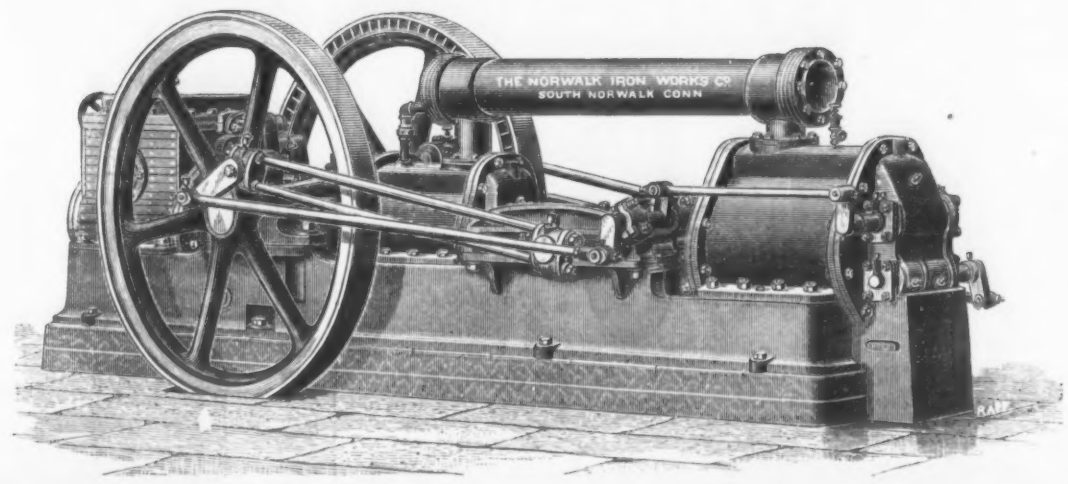

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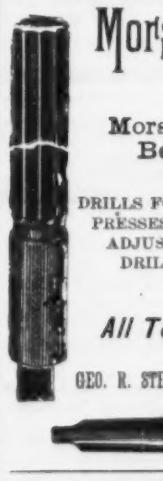

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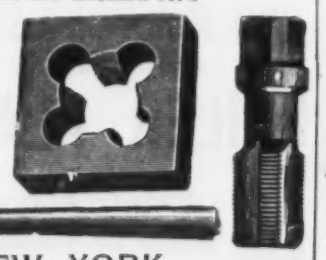

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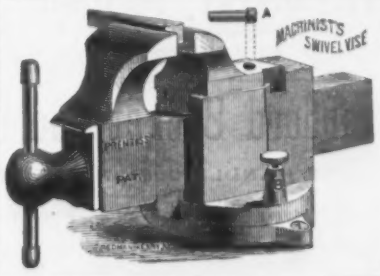

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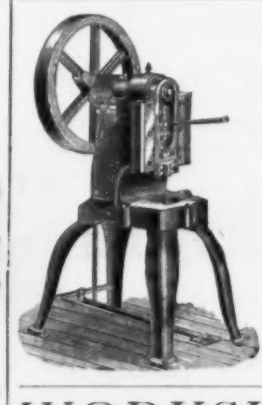

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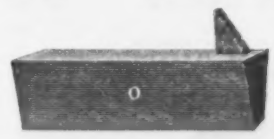

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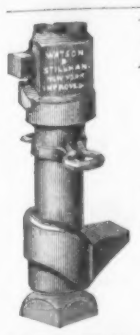

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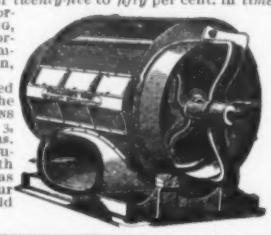

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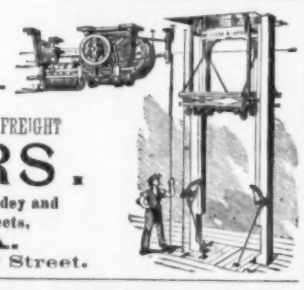

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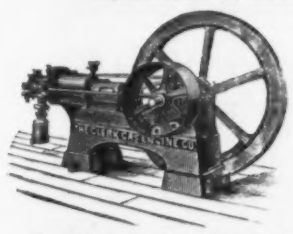

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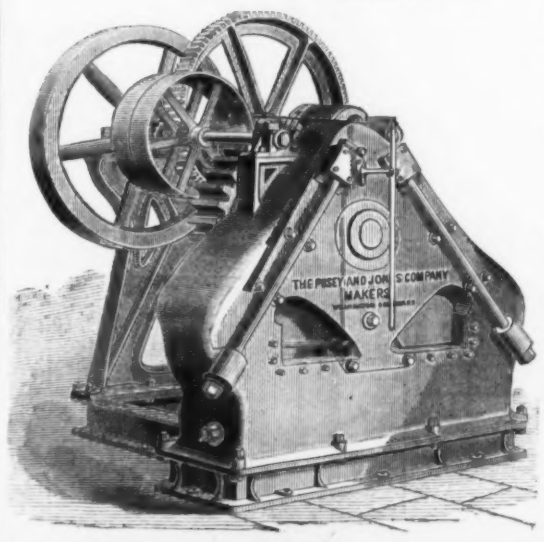

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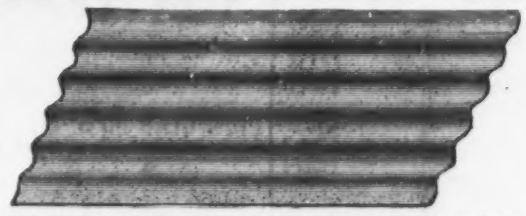

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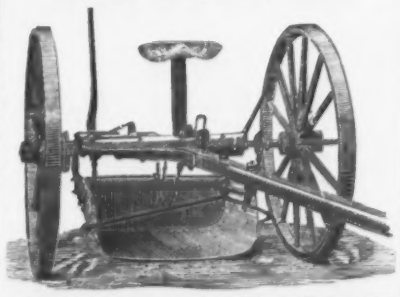

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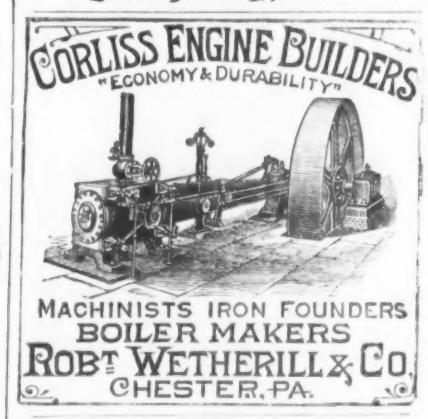

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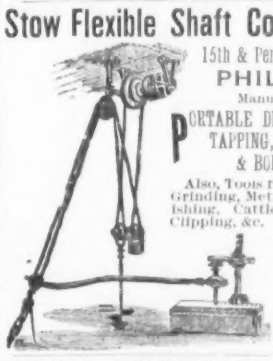

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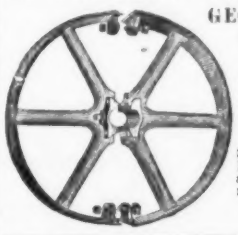

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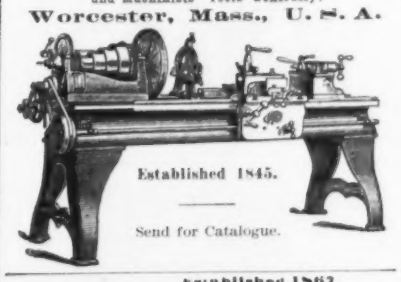

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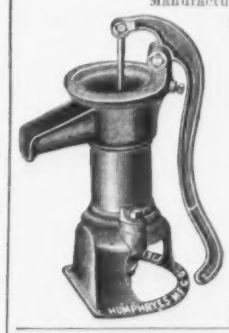

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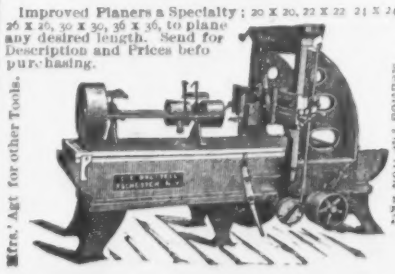

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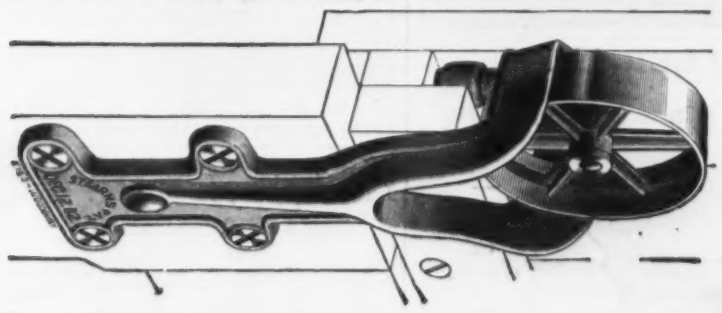

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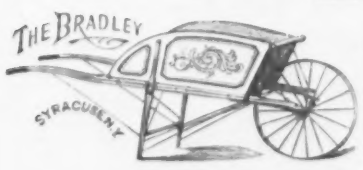

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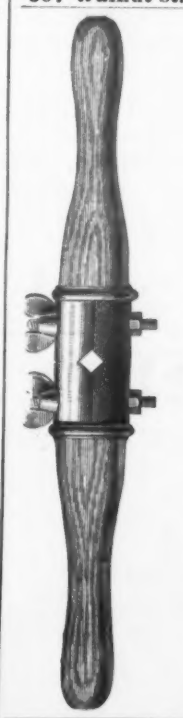

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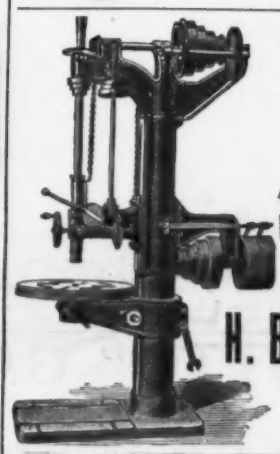

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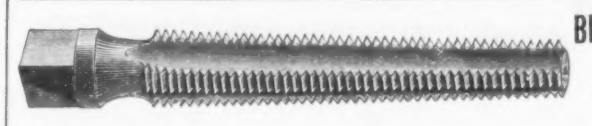

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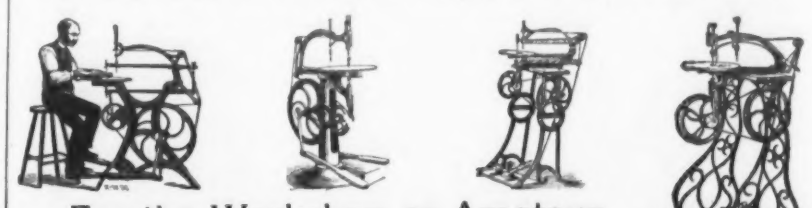

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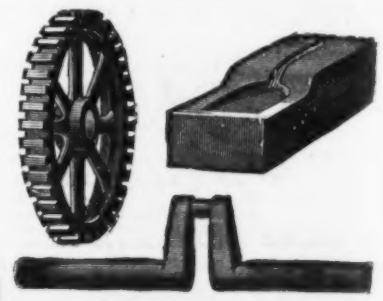

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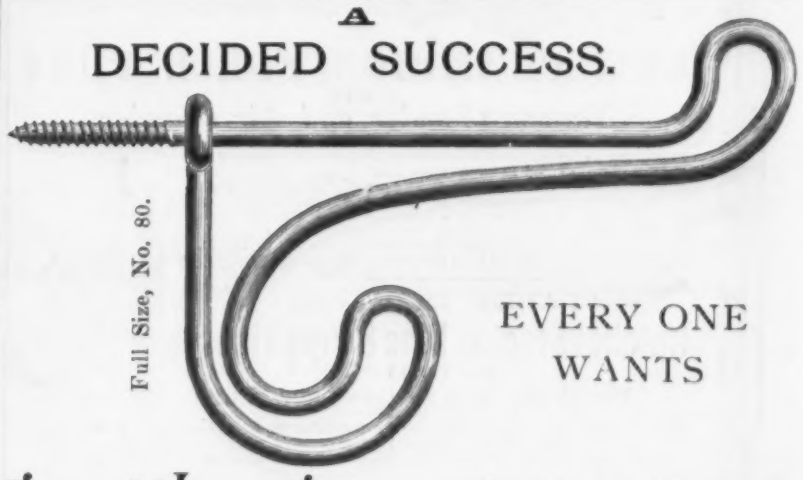

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